

A List of the Ferns of the Malay Peninsula.

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As might be expected in a wet tropical forest region such as the Malay Peninsula, the number of ferns is very large, no less than 382 species being recorded, and further the number of individuals is so large that they form a very conspicuous feature in the forests and damp open spots.

That the number of species occurring here will be very largely increased by further discoveries may be taken as certain, for there still remains a very large area of the country especially in the centre and northern part of the peninsula which has not as yet been investigated by the lovers of ferns.

The ferns of the plain country of the west coast are probably pretty well known and the Thaiping Hills and some of the other hill-ranges have been the collecting grounds of Day, Scortechini, and Kunstler. The ferns of Penang were well collected by Curtis, but the hill-ranges of Selangor and Pahang and the low country of the east coast have as yet been only partially searched and that mainly by myself. The northern states on the borders of Siam have been hardly investigated at all, and are likely to produce many additions to our flora.

In following the arrangement of Beddome's Ferns of British India, I have incorporated into the list some species recorded by him from definite localities in the peninsula which have not been seen by me. There are however a good many recorded by him as from "Malay peninsula" without special localities, and which have not been apparently met with again. These I have excluded at present as some authors include Tenasserim as part of the Malay peninsula and the plants thus vaguely localised may have been obtained across the border.

I am indebted to Dr. Christ of Basle for identification of many species, as well as to Bishop Hose, and Surgeon General C. T. Matthew, who always spent his spare time in Singapore during the short stays of his ship in searching the forests of Singapore for ferns, with no little success.

The chief collectors of ferns in the peninsula have been Father Scortechini, Mr. Day, Mr. Kunstler, who collected for the Calcutta Gardens, Mr. Hullett, Right Reverend Bishop Hose, Mr. Curtis and in earlier days W. Norris, Lady Dalhousie, Mr. Pinwill, Dr. Wallich and Cuming.

Habitats. The most abundant and conspicuous fern is perhaps the well-known "Resam" *Gleichenia linearis* which covers considerable tracts of country on the edges of forest, and where the forest has been felled and burnt. In such spots it produces dense thickets very troublesome to penetrate. In the hill districts it is replaced by other species of *Gleichenia*, *G. hirta*, *G. glauca* and *G. flagellaris*. In more sandy places in the low country, we find the common bracken, *Pteris aquilina* taking its place. This is probably the most widely distributed and abundant of any vascular plant in the world. It is remarkable too how little this plant varies in different regions of the globe. There is but little visible difference between the bracken of the woods of Kent and that of the hot sandy country of Singapore, the chief difference being the more woody texture of the stalks in the tropical form.

Another fern which forms thick masses is the local *Matonia pectinata* of Mount Ophir and others of our higher hills. This beautiful fern often occurs growing in close thickets, like bracken.

Dipteris Horsfieldii grows in a similar manner over the sea-coast cliffs and on clay banks at 2000 feet and upwards in close masses. It is noticeable that all these ferns are remarkably difficult to cultivate, abundantly and readily as they grow in a natural state. All attempts to grow *Dipteris* and *Matonia* have failed, while the *Gleichenias* and the Bracken too are notoriously troublesome to transplant.

Very common and conspicuous too are the *Lygodiums*, known here as "Ribu-Ribu," literally "thousands," from

their numerous leaflets, *L. circinatum* and *L. microphyllum*. So abundant are these ferns climbing over bushes and through grasses, that they are extensively used in decorating ballrooms in the form of twisted ropes of the ferns.

Anisogonium esculentum is a very common fern fringing the banks of muddy rivers in dense thickets, and very abundant too is the "Lamiding" *Stenochloena palustris* scrambling and climbing over trees and bushes. Both of these last mentioned ferns are eaten as potherbs by the Malays.

Acrostichum aureum a big tufted fern occurring in tidal river mud all over the warmer parts of the world is very abundant. It occasionally is to be met with in damp places far away from the sea or any tidal river. In most of these places however I believe that it has merely persisted for many years after the river on whose banks it formerly grow has been silted up and now forms part of the dry land. A large clump still grows in the Economic Gardens at Singapore where the original river on which it doubtless first started its growth has been dry land since any history of it has been known, though Nipah fruits still dug up in the surrounding soil prove that at one time the tides reached this spot. I have also found the *Acrostichum* far inland at the base of Gunong Pantai in Johor, and still further from the sea at Bukit Asahan at the foot of Mount Ophir and over thirty miles from the Coast. Most of the ferns however occur in a more isolated manner, though many are very abundant.

The richest localities for ferns are the wet densely forested hills at altitudes of from 1000 to 5000 feet but the damp rocky woods of the plains are also very rich. The drier woods are less abundantly supplied, but many species are very characteristic of this kind of locality. Such are the *Schizoeas*, *Lindsayas*, *Nephrodiums*.

Even the sands of the sea-coast produce some species such as *Davallia solida* and *D. elegans*, the *Humatas* and *Schizaea dichotoma*. At high elevations there is a noticeable disappearance of the thin textured ferns such as the *Nephrodiums* and *Lastraeas*, which are replaced by the more cori-

aceous leaved xerophytic *Dipteris*, *Matonia*, *Polypodiums*, *Oleandras* and such ferns.

Epiphytic species are very abundant frequently covering the trees, especially at high altitudes, but as it seen in other groups of plants, ferns which in the plants only occur on the upper branches of lofty trees, grow at an altitude of three or four thousand feet quite low down, and not rarely on rocks. Some of these high growing ferns are not at all easy to cultivate at low altitudes, but *Davallia triphylla* which only occurs in a wild state on the topmost boughs of trees a hundred or a hundred and fifty feet high, I have met with on several occasions transplanted, accidentally or intentionally to the base of trees a few feet from the ground and thriving well. This fern was formerly considered so rare that about 20 years ago few herbaria in Europe had a specimen, but as a matter of fact it is by no means a rare plant. Growing as it does only on the inaccessible branches of lofty trees, it could only be obtained by searching for fallen boughs on which it happened to be growing.

Two of the most curious of our ferns are epiphytic plants remarkable for their rhizomes being modified so as to form nests for ants. They are *Lecanopteres carnosa* and *Pleopeltis sinuosa*. The former which occurs abundantly on trees at 3000 much after the manner of the rubiaceous plant *Myrmecodia*. *Pleopeltis sinuosa* has a thick scaly rhizome hollow inside and also inhabited by ants. It is abundant in Singapore. It is curious that fleshy and succulent as the rhizome of this plant is, it is one of the first epiphytic plants to die during a short dry spell. One would have thought its supply of water in the rhizome would have been sufficient to have prevented this.

Distribution of Ferns. As ferns are disseminated by the floating of their dust-like spores on the wind to immense distances it will easily be understood that many of the species have a very wide distribution over the surface of the globe. Ferns indeed are among the first of the higher plants to appear on newly cleared ground, if the soil and climate suit them.

The majority of our ferns occur in the Malay islands also, and a large proportion are found in the Mascarene islands, as well as India and Polynesia and South America, which is not the case with the higher flowering plants, few of which except some weeds carried about by human agency have as wide a distribution. Six species even occur in the British Isles, viz., *Trichomanes radicans*, *Hymenophyllum Tunbridgense*, *Pteris aquilina*, *Lastrea Thelypteris* and *Polystichum aculeatum* and *Adiantum Capillus-veneris*.

There are however about 40 species which are endemic, never having been collected anywhere else except in the peninsula at present.

USES OF FERNS.

A good many of the local ferns are used for food in the form of pot herbs in place of spinach, or as sumbuls with curry, but chiefly by natives; for excellent as many of these are, Europeans are not acquainted with their merits and rarely use them. Among the most popular are *Stenochloena palustris* the "Miding" or "Lamiding" of the Malays, *Anisognium esculentum* "Paku Anjing," and the water-fern *Ceratopteris thalictroides*, which occurs often abundantly in ditches. Of these ferns the young fronds are collected and boiled.

From the stems of Resam, (*Gleichenia linearis*) are made pens, and they are also used for making the walls and partitions of the fishing-stakes.

The fronds of the common *Pleopeltis Phymatodes*, when dry, exhale a delicious odour of Coumarin, like that of the Tonkin bean. Hence this fern is known as Paku Wangi or scented fern. The fronds are dried and put among clothes, especially I am told by the Eurasian population in order to give them a pleasant perfume.

Comparatively few ferns are accredited here with medical properties. The golden brown hairs on the rhizome of *Cleotium Barometz* are used as a styptic for wounds for which they are very suitable, and the rhizomes are sold in the drug-shops

under the name of 'Penawar Jambi.' This vegetable fur is even exported to Europe for the same purpose, being used not only as a styptic but as an antiseptic in planters.

The fronds of the number of a softer textured ferns are used pounded up as poultices for boils or sores; such are those of *Cyathea Brunonis* (also eaten as a pot herb by Jakuns), and *Phegopteris punctatum*.

The ashes of *Drynaria quercifolia* fronds are applied to the abdomen in cases of miscarriage.

GLEICHENIACEAE.

GLEICHENIA.

Gl. circinata (Sw.) Damp rocks and streams at about 4000 feet elevation. Malacca, Mt. Ophir (Hullett, Derry 605); Perak, Gunong Bubu (Cantley); Kedah, Gunong Jerai (Ridley). Distrib. Australia, New Zealand and New Caledonia.

Gl. dicarpa (Br.) Perak, Gunong Berumbun (Wray 1584); Province Wellesley, Bukit Panchur (Ridley 12633).

var. *alpina* Bedd. Perak (Scortechini, King's Coll. 7345). Distrib. Malay isles, Australia, New Zealand.

Gl. hirta (Bl.) Hill districts. Malacca, Mt. Ophir (Lang, Ridley); Perak (Scortechini); Penang Hill (Norris, Hullett); Kedah, Gunong Jerai (Ridley).

Gl. Norrissii Mett. Hill districts. Perak, Bujong Malacca (Ridley 9599, Curtis 3314); Gunong Bubu (Wray 240); Gunong Batu Putih (Wray 243). Endemic.

Gl. glauca (Hook.) *G. longissima* Bl. Very abundant at about 1000 feet elevation and upwards, forming dense masses. Johor, Gunong Pulai (Ridley 12127); Malacca, Mt. Ophir (Lang); Perak, Larut Hills (Fox 131, Ridley 10658); Penang Hill very abundant (Ridley 7082); Kedah, Gunong Jerai (Ridley). Distrib. Malaya, China, Australia, Polynesia, Trop. America.

Gl. flagellaris Spr. Abundant on hill tops from about 1000 feet upwards. Malacca, Mt. Ophir (Derry 604); Negri Sembilan, Gunong Angsi (Ridley); Perak, Maxwell's Hill (Ridley 10659); Penang Hill (Hullett). Distrib. Mascarene isles, Malay-isles, Polynesia.

Gl. linearis (Burn). *Gl. dichotoma*, Willd. The commonest occurring everywhere in the low country, in immense almost impenetrable masses. Native name "Resam." The stems used for making pens, and also for fishing stakes. Singapore, Tanglin, etc. (Ridley); Malacca; Johor, Gunong Pulai (Ridley 12128); Perak, Gopeng, Sungai Rayah (King's Coll. 1065); Penang. Distrib. India, Japan, Australia, Polynesia, Trop. America.

CYATHEA.

C. Brunonis Wall. Common in woods at no great elevation. Native names "Paku Pahat," "Paku Gajah Payah," "Paku Hitam Payah," "Paku Salamah." The leaves are eaten as a vegetable by the Jakuns, and also used to poultice sore legs. Johor, near Castlewood, Batu Pahat (Ridley 11061); Negri Sembilan, Perhentian Tinggi (Ridley); Malacca, Bukit Kayu Arang (Cantley's Coll.), Bukit Tungul (Ridley 4403), Bukit Bruang; Pahang, Tahan River (Ridley); Selangor, Kwala Lumpur (Ridley 10483), Batang Padang (Murdoch); Perak, Goping (King's Coll. 475), Larnt (King's Coll. 4885); Peuang Hill near the top (Ridley 7036). Distrib. Malay islands.

AMPHICOSMIA.

A. alterans Hook. Singapore, Bukit Timah (Ridley 12554); Johor, Batu Pahat (Hullett); Selangor, Kwala Lumpur (Ridley 10173); Perak, Gunong Babu (Cantley); Penang Hill, Penara Bukit (Ridley 7153, 7156, 10139). Distrib. Borneo.

A handsome tree fern in damp forests.

ALSOPHILA.

A. latebrosa Hook. The commonest tree fern in the low country, stem 8 to 12 feet tall. Singapore common, Bukit Timah, Chan Chu Kang (Ridley 6123), Chua Chu Kang (Ridley 6029); Johor, Tanjong Kupang (Ridley 4400); Malacca, Ayer Panas, Ayer Keroh (Ridley 10705); Selangor, Batang Berjuntai (Ridley 7870), Gua Batu (Ridley 8141); Perak, Larut (King's Coll. 23591, 7317), Thaiping (Curtis); Penang Hill, Province Wellesley, Tasek Gelugur (Ridley 6965); Kedah, Yan (Ridley 5177).

A. comosa Hook. Not rare in the low country, stem 8 or 9 feet tall. Singapore, Bukit Timah, Jurong (Ridley 5756). Reservoir woods. Perak, Kinta (King's Coll. 7148), Larut (Bishop Hose); Penang Hill (Hullett), Road to Penara Bukit (Ridley 7153). Distrib. Malay isles.

A. Ridleyi Baker. Stem very short almost none. Damp low-woods. Singapore, Sungai Morai (Ridley 4401), Chan Chu Kang (Ridley 6122), Chua Chu Kang (6031). Endemic.

A. commutata Mett. Hills at 4000 feet. Malacca, Mt. Ophir (Ridley 9857, 3319); Pahang, Kluang Terbang (Barnes); Selangor, Bukit Hitam (Ridley 7869); Perak, Larut (King's Coll. 1908, 7150), Gunong Babu (Cantley), Bujong Malacca (Ridley 9604).

A. glabra Hook. Perak (Scortechini); Kedah Peak (Ridley 5156, 5157); Langkawi, Gunong Rayah (Curtis). Distrib. India, China, Malaya.

A. glauca (Sw.) *A. contaminans* Hook. A splendid tree fern sometimes 20 feet tall, with the rachis and petiole ashy blue. Johor, Bukit Soga (Ridley 1066); Sungai Ujong (Hullett); Selangor, Pahang track (Ridley 8633), Ginting Bidai (Ridley 7868); Perak, Larut Hills (King's Coll. 4032). Common near the top of the hills.

Penang Hill common at the top (Ridley 7150). Distrib. India and Malay islands.

I found a very curious form with fasciated fronds on the Thaiping hills near the top.

A. *Kingii* Bedd. Johor, Gunong Panti (Ridley); Perak, top of Gunong Bubu (King's Coll. 7402, Wray 3860). Endemic.

A. *crenulata* Mett. Johor, Gunong Panti (Ridley); Selangor, Bukit Kutu (Ridley 7865); Dindings, Lumut (Ridley); Perak, Gunong Keledang (Ridley 9548), Bujong Malacca (Ridley 9551); Waterfall, Thaiping Hills (no 7865). Distrib. Java.

A. *dubia* Bedd. Perak (Scortechini), Larut (King's Coll. 2493). Endemic.

A. *obscura*, Scort. Perak, Gunong Hijau (Scortechini). Endemic.

A. *trichodesma* Bedd. Perak (Scortechini). Endemic.

MATONIA.

M. pectinata Br. By no means one of the rarest ferns as Beddome says. It is local but usually very abundant growing like bracken, where it occurs usually in open spots on the top of hills. Malacca, Mount Ophir, Padang Batu, (all collectors) 3000 feet elevation. Selangor, Hulu Semangkok (Ridley); Perak, Gunong Bubu (Scortechini 761); Kedah Peak (Ridley).

It also occurs in the Carimon islands quite low down near the Waterfall and in Borneo.

DICKSONIEAE.

DICKSONIA.

D. ampla Bak. Perak, Maxwell's Hill (Ridley 5188), (King's Coll. 2159). Also Borneo.

D. Kingii Bedd. Perak, Gunong Batu Putih (King's Coll. 8058) and Larut (2118). Endemic.

CIBOTIUM.

C. Barometz, Link. In woods at no elevation, not rare. Native name "Penawar Jambi." The hairs from the rhizome sold as a styptic. The rhizome usually short creeping but I found it with a stem 4 feet tall on Kedah Peak. Johor, Batu Pahat (Ridley 10981); Selangor, Bukit Kutu (Ridley 7864); Perak, Bujong Malacca (Ridley 9532), Gunong Batu Putih (Wray 489), Gunong Hijau (Scortechini 1226); Kedah, Gunong Serai (Ridley 5176); Penang, Mt. Erskine (Curtis). Distrib. Malay islands and S. China.

LECANOPTERIS.

L. carnosa Bl. Epiphytic with great irregular hollow tuberculated rhizomes full of ants. On very lofty Diptero-carpus trees in the lower country, on lower trees in the hills. Singapore, Bukit Timah (Ridley); Malacca, Sungai Hudang (Goodenough no 1477); Selangor, Bukit Hitam (Kelsall); Perak, Thaiping Hills (Hervey, etc.) very abundant, Gunong Bubu (Cantley). Distrib. Malay isles.

HYMENOPHYLLUM.

H. polyanthos Sw. Common on trees and rocks, in the low country and up to a considerable altitude. Singapore, Bukit Timah, Bajau, Kranji (Ridley 5607); Johor, Kampong Bahru, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (R. Derry); Perak, Bujong Malacca (Ridley 9609); Penang Hill (Hullett, Ridley 7072); Kedah, Gunong Jerai (Ridley). var. *Blumeana*. Singapore, Bukit Timah (Matthew), Sungai Morai (Ridley 4406), Bukit Mandai (Ridley

8938) ; Pahang, Tahan River (Ridley) ; Selangor, Bukit Kutu (Ridley 7872) ; Perak (Scortechini 320).

H. javanicum (Spreng.). Rocks and trees from about 1000 feet upwards. Johor, Gunong Pulai (Hullett) ; Malacca, Mt. Ophir (Ridley 9992) ; Selangor, Pahang Track (Ridley 8773, 8774) ; Perak, Thaiping Hills (King's Coll. 2187, Scortechini, Wray), Bujong Malacca (Ridley).

var. *badium*. Perak, Maxwell's Hill (Bishop Hose, Ridley 5182, Curtis 2084) ; Penang Hill (Hullett). Distrib. Mascarene islands, India to Australia.

H. Smithii Hook. Singapore, Kranji (Matthew) ; Johor, Gunong Banang, Batu Pahat (Ridley 10985) ; Selangor, Semangkok Pass (Ridley 12034) ; Penang Hill (Ridley 7072). Distrib. Malay isles.

H. productum Kze. Singapore, Kranji (Ridley 1687) ; Perak, Maxwell's Hill (Wray) ; Kedah, Gunong Jerai (Ridley). Distrib. Malaya, Polynesia.

H. dilatatum (Sw.) Perak, Larut (King's Collector). Distrib. Java and New Zealand.

H. tunbridgense Sm. Rare. Kedah Peak (Ridley 5178). Distribution Europe, Africa, South America and New Zealand. Identified by Dr. Christ.

H. aculeatum V. D. Bosch. Singapore, Woodlands (Christ) ; Perak at 4000 feet alt. (King's Coll.) ; Penang 3000 feet alt. (Day). Also Java.

H. affine V. D. Bosch. Johor, Mt. Austin (Ridley 12539, 12540), Gunong Pulai (Ridley 12135). Distrib. Java.

H. denticulatum Sw. Singapore, Kranji (Ridley 1687) ; Perak, Maxwell's Hill (Wray) ; Kedah, Gunong Jerai (Ridley). Distrib. Java.

H. Neesii Hook. Common on trees low country up to 4000 feet elevation. Singapore, Bukit Mandai (Ridley 9840), Kranji, Woodlands, Selitar ; Johor, Pengaram, Tanjung Bunga (Ridley) ; Malacca, Mt. Ophir, Gunong Mering (Ridley), Batu Tiga (Derry) ; Pahang, Tahan River

(Ridley 2153, 2174), Kluang Terbang (Barnes); Selangor, Rawang, Bukit Kutu (Ridley 9852), Hulu Semangkok (12036); Negri Sembilan, Perhentian Tinggi (Ridley); Dindings, Lumut (Ridley 7145); Perak (Scortechini), Maxwell's Hill (Curtis 2083), Bujong Malacea (Ridley 9610); Penang Hill, Penara Bukit (Ridley 7146). Distrib. Malay isles, Fiji.

TRICHOMANES.

Tr. Motleyi V. D. Bosch. Singapore, Stagmount (Ridley). Distrib. Tenasserim, Andamans, Ceylon, Borneo, New Caledonia.

Tr. Henzaianum (Parish). Singapore, Feruvalley, Bukit Timah (Matthew). Distrib. Burmah.

Tr. muscoides (Sw.) On Rocks. Singapore, Feruvalley, Bukit Timah; Malacca, Mt. Ophir (Ridley). Distrib. India and Tropical Africa and America.
var. *sublimbatum*. Very near the last species. Perak, Rocks, Bujong Malacca (Ridley).

Tr. neilgherrense, Bedd. Perak (Scortechini). Distrib. S. India.

Tr. parvulum Poiret. Perak (Scortechini); Penang Hill (Ridley 1748); Kedah Peak (Ridley). Distrib. Madagascar, India, Malay isles, Japan, China and Polynesia.

Tr. humile Forst. Singapore, Woodlands (Matthew). Distrib. Pacific islands, Philippines.

Tr. palidum Bl. On trees and rocks usually at a considerable elevation, easily recognized by its ashy grey color when alive. Singapore, Kranji (Matthew); Johor, Gunong Panti (Ridley 4161); Malacca, Mt. Ophir (Ridley 9885); Perak, Gunong Hijau (Scortechini). Distrib. Java.

Tr. digitatum Swartz. On trees. Singapore, Kranji (Ridley); Pahang, Tahan River (Ridley); Selangor, Bukit Kutu (Ridley 7873); Perak (Scortechini), Gunong

Hijau (Ridley); Penang Hill (Bishop Hose), Penara Bukit (Curtis 3062); Kedah Peak (Ridley). Distrib. Mauritius and Java.

Tr. proliferum Bl. Perak, Larut 100-4000 feet (King's Coll. 2565). Distrib. Java, Philippines.

Tr. bipunctatum Poir. *T. Filicula* Bory. On rocks. Singapore, Chan Chu Kang (Ridley); Johor, Gunong Panti (Hullett); Selangor, Bukit Hitam, Petaling, Langat, Batu Caves (Ridley 8143), Pahang Track (Machado); Dindings, Lumut (Ridley); Perak, Larut (King's Coll. 1860, 1913, Scortechini), Thaiping (Ridley), Bujong Malacca (Ridley 9606). Distrib. African islands, India, Ceylon, Pacific islands.

Tr. pyxidiferum L. Perak (Scortechini), Goping (King's Coll. 4185); Penang Hill (Ridley). Distrib. Brazil.

Tr. javanicum Bl. very common on rocks in forest. Singapore, Bukit Timah (Ridley 9569); Johor, Gunong Panti, Batu Pahat (Ridley 11065); Pahang, Tahan Woods (Ridley 2181); Selangor, Rawang, Bukit Hitam, Pahang Track (Ridley 8665); Dindings, Lumut (Ridley 7149a); Perak, Maxwell's Hill at 3000 feet (Scortechini 541), Goping (King's Coll. 584); Penang Hill (Ridley 7149); Lankawi (Curtis 2423). Distrib. India, Malay Archipelago.

Mixed with garlic and onion the dried fronds are smoked as tobacco to cure headaches.

Tr. rigidum, Swartz. Common in woods. Singapore, Bukit Timah, Sungai Buluh, Chan Chu Kang (Ridley 6119), Toas (4407); Johor, Castlewood, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley 2161); Malacca, Mt. Ophir (Ridley 3332, 3320); Negri Sembilan, Gunong Angsi (Ridley 11815); Selangor, Batu Caves (Ridley 8661), Bukit Hitam (Kelsall), Bukit Kutu (Ridley 7871); Perak, Larut (King's Coll. 2404); Penang Hill (Ridley); Kedah, Gunong Jerai (Ridley); Tringanu,

Bundi (Rostado). Distrib. S. Africa and islands, Ceylon, Malay Archipelago, Polynesia and S. America.

Tr. pluma Hook. Not rare in the hills at about 4000 feet alt. Malacca, Mt. Ophir (Bishop Hose, etc.) ; Selangor, Bukit Hitam, Ginting Bidai, Semangkok Pass (Ridley 12107) ; Perak, Bujong Malacca (Ridley), Gunong Bubu (Cantley), Gunong Hijau (Wray, Scortechini 344).

Tr. parviflorum Poir. *Tr. foeniculaceum* Bory. Singapore, Moores Herb (fide Beddome) ; Perak, Gunong Bubu (Murton). Distrib. Mascarene isles, Borneo, Queensland.

Tr. gemmatum Sm. Malacca, Mt. Ophir, Mering and Tunduk (Ridley 9881, Derry 607). Distrib. Malay isles, Polynesia, S. America.

Tr. apiifolium, Presl. Malacca, Mt. Ophir (King's Collector fide Beddome). Distrib. Malay isles, Polynesia.

Tr. hispidulum Mett. Singapore, near Selitar (Matthew and Ridley) ; Perak and Goping (King's Coll. 531), Tapa (Wray 1365). Distrib. Borneo.

Tr. maximum Bl. Johor, Gunong Panti (Ridley) ; Malacca (loc. incert.), (Hervey) ; Selangor, Pahang Track (Ridley 8638), Semangkok (12032) ; Perak, Bujong Malacca a curious small form (Ridley 9534), Larut 2500-3000 (King's Coll. 2225-5286), Maxwell's Hill (Scortechini 225), Tea Gardens (Ridley 3059). Distrib. Malay isles and Polynesia.

Tr. radicans, Sw. Johor, Patani, Batu Pahat (Ridley 10979) ; Malacca, Jeram Nyalas (Derry 1126) ; Sungai Ujong (Hullett) ; Perak, Maxwell's Hill (Ridley 5183, 1670), Gunong Batu Putih (King's Coll. 8045) ; Penang Hill at 2500 feet (Hullett). Distrib. Both hemispheres.

Tr. denticulatum Bl. Johor, Gunong Pantai, Gunong Pulai (Ridley 12135) ; Negri Sembilan, Perhentian Tinggi (Ridley) ; Penang Hill ; Kedah Peak (Ridley). Distrib. Java.

Tr. auriculatum Bl. In the hill woods on trees. Selangor, Ginting Bidai (Ridley 7874); Perak, Maxwell's Hill (Curtis, Scortechini), Gunong Batu Putih (Wray 351). Distrib. Malay isles, Japan and Guiana.

Tr. malaccense Christ. Malacca, Mt. Ophir (Lang); Perak, Bujong Malacca (Ridley 9611), Thaiping Hills. Endemic.

Tr. obscurum Bl. Malacca, Mt. Ophir, Gunong Tunduk (Ridley 9882, 9883); Perak, Bujong Malacca (Ridley 9608). Distrib. Java.

Tr. Ridleyi Chr. Singapore, Bukit Timah (Ridley).

Tr. sp. Penang, Moniots Road (Matthew).

DAVALLIEAE.

HUMATA.

H. heterophylla Smith. On dead trees or high up on living ones, or also on the ground near the sea. Singapore, Kranji (Ridley 8940), Bajau, Changi beach (4355), Pulau Brani and Pulau Ubin (Hullett); Johor, Bukit Patani, Batu Pahat (Ridley); Pahang, Pekan (Ridley 2160); Perak, Lampatang (Scortechini 1554), B. P. D. (King's Coll. 7821). Malay isles, Polynesia.

H. angustata Wall. Singapore (Cuming 335), Sungei Morai, Chan Chu Kang (Ridley 3599); Johor, Bukit Pengarum, Kampong Bahru (Ridley); Malacca, Mt. Ophir (Ridley 3336); Selangor, Pahang Track (Ridley 8647); Dindings, Lumut (Ridley 7136); Perak, Sungei Ryah (King's Coll. 828), Maxwell's Hill (Scortechini 408), Bujong Malacca, Gunong Keledang (Ridley 9550); Penang, Waterfall (Ridley), Hill (King); Kedah Peak (Ridley 5179). A very curious form crenately deeply lobed to the midrib grows on the rocks on Padang Batu, Mt. Ophir (No. 3339). Endemic.

H. parallela Wall. Singapore, Tanjong Merawan (Ridley); Malacca and Johor; Pahang, Pekan (Ridley); Lankawi (Curtis). Distrib. Burmah to Polynesia.

H. pedata Smith. Singapore, Kranji; Johor, Sungei Bau, Mt. Austin; Malacca, Tanjong Kling (Ridley); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Dindings, Lumut (Ridley 7155); Tringganu, Bundi (Ros-tado); Penang (King 1374), Penang Hill (Ridley 7077); Kedah Peak (Ridley 5179); Lankawi (Curtis). Distrib. Malay isles, India, Ceylon, Mascarene isles.

H. pinnatifida Baker. Rare. Malacca Mt. Ophir (Ridley); Perak, Larut 3-4000 feet alt. on trees (King's Coll. 6393). Also Borneo.

H. sessilifolia Bl. "Singapore Sinclair") Beddome. Distrib. Java. Not seen.

LEVCOSTEGIA.

L. hymenophylloides Bl. On rocks and rotten trees. Perak, Bujong Malacca (Ridley 9545), Gunong Batu Putih (King's Coll. 8046), Kinta (King's Coll. 7128); Penang, near Richmond pool (Hullett, King). Distrib. Malay isles to Polynesia.

L. nodosa Presl. Perak, top of Gunong Babu 5000 to 5300 feet alt. (King's Coll. 7421, Wray 383). Distrib. India and Java.

L. parvula Sm. On trees in mangrove swamps. Singapore, Sungei Buluh, Tanjong Merawan, Kranji (Ridley 87). Distrib. Malay isles.

L. affinis Hook. Perak, Gunong Batu Putih (Wray 1030); Penang (Lady Dalhousie). Distrib. Ceylon and Malay isles.

PROSAPTIA.

P. Emersoni Presl. On trees and rocks usually on the hills. Johor, Gunong Pulai (Hullett); Malacca, Batu Tiga (Derry); Selangor, Rawang, Bukit Kutu and Bukit Hitam (Ridley 8964); Perak, Hermitage Hill, Bujong Malacca (Ridley), Maxwell's Hill (Scortechini 120,

215); Prov. Wellesley, Bukit Panchur (Native Coll.); Penang, Government Hill (Ridley, Kunstler 1307); Kedah Peak (Ridley 5170). Distrib. Malay isles and India.

P. contigua Swartz. Pahang, Tahan River (Ridley); Sungai Ujong (Hullett); Perak, Gunong Hijau (Scortechini 490). Distrib. Malay isles and India.

DAVALLIA.

D. solida Swartz. Common on tree trunks and in dry sandy spots. Singapore, abundant in the Botanic Gardens, Sungai Morai (Ridley); Johor, Jaffaria (King); Pahang; Perak, Kinta (King's Coll. 7068); Selangor, Ginting Bidai (Ridley 984); Penang, above the Waterfall (Hullett); Kedah, Yan (Ridley). Distrib. Polynesia and Malay isles.

D. elegans Swartz. On trees or sandy points, "Paku Terutep." Singapore, Changi beach (Ridley 4351); Pahang, Pekan, Kota Glanggi (Ridley 1598a); Malacca, Sungai Hudang (Ridley), Pulau Undan (Cantley's Coll.), Jasin (Goodenough); Selangor, Semangkok Pass (Ridley); Perak (Scortechini), Thaiping Hills Cottage (Hervey); Tringganu, Cherating River (Ridley); Prov. Wellesley, Permatang Bertam on cocoanut trees (Ridley); Kedah, Kedah Peak (Ridley 5159). Distrib. Africa, India, China, Malay isles, Polynesia.

D. epiphylla Bl. On rocks. Perak, Gunong Batu Putih (King's Coll. 8037). Distrib. Polynesia and Java.

D. divaricata Bl. Perak (Scortechini). Distrib. Java.

D. bullata Wall. Selangor, Pahang Track (Ridley 8637); Perak, Larut Hills 3500-4000 feet alt. (King's Coll. 6081), Caulfield's Hill (Scortechini 391); Kedah Peak, rocks of the precipice (Ridley 5158). Distrib. Assam and Nepal.

D. triphylla Hook. On boughs of lofty trees rarely low down. Singapore (Cuming 339), Woodlands, Bukit Timah

(Ridley 9095) ; Johor, Bukit Patani, Batu Pahat (Ridley 11064), Gunong Pulai (Hullett) ; Negri Sembilan, Perhentian Tinggi (Ridley 10819) ; Perak (Scortechini). Endemic.

MICROLEPIA.

M. pinnata Cav. "Paku Merah" on banks in the hills. Johor, Gunong Pulai (Ridley) ; Malacca, Mt. Ophir (Ridley 3318) ; Selangor, Batang Padang (Near dock), Bukit Hitam (Ridley), Pahang Track (Ridley 8660) ; Perak, Larut Hills (Scortechini 153, 407), Gunong Keledang (Ridley 9541) and Bujong Malacca (9533) ; Penang Hill abundant at the top (Bishop Hose, Ridley, Wallich, Lady Dalhousie).

var. *luzonica*. Perak, Larut (King's Coll. 2144).
Distrib. Philippines.

M. strigosa Swartz. Selangor, Rawang, Ginting Bidai, Bukit Kutu (Ridley 7860) ; Penang, Penara Bukit (Curtis 3061).

M. Kurzii Clarke. Perak, Gunong Bubu (King's Coll. 8331).

M. marginalis Thunb. Lankawi (Curtis) not in fruit but the frond resembles this plant.

D. Mooreana aff. but pinnules much larger. Perak, Larut Hills (Curtis 3723).

M. speluncae L. Singapore, Ang Mo Kio, Changi (Ridley 6034), Gelang by a tidal stream (6248) ; Johor, Tebing Tinggi (Ridley) ; Pahang, Kuala Tahan ; Selangor, Caves, Kuala Lumpur (Ridley 8641), Ginting Bidai (Ridley 7855) ; Negri Sembilan, Perhentian Tinggi (Ridley 9856) ; Perak, Thaiping (King's Coll. 8371), Tanjong Malim (Ridley), Telor Pinang (9746) ; Penang (Curtis) ; Prov. Wellesley, Tasek Gelugur (Ridley) ; Kedah (King's Coll. 1245), Lankawi (Fox) ; Kelantan, Kamposa (Ridley) a very glabrous form.

var. *hirta*. Selangor, 15th mile Pahang Track (Ridley 8637) ; Perak, Ulu Kerling (King's Coll. 8661).

M. moluccana Bl. Perak alt. 3000-4000 feet (Scortechini), Maxwell's Hill (Curtis 2085); Selangor, Pahang Track (Ridley 8634). Distrib. Malay isles.

STENOLOMA.

S. chinensis Swartz. The Lace fern, on banks at considerable altitudes, this plant seems to prefer stiff yellow clay. Pahang, Kuala Pahang near the Sultans tombs (Ridley 4230), Tahan River; Selangor, Ginting Bidai, Semangkok Pass common (Ridley); Penang, Penara Bukit, etc. common (Ridley). Distrib. Mascarene, India, Malay isles, China, Polynesia.

LINDSAYEAE.

LINDSAYA.

L. cultrata Swartz. On rocks and banks. Pahang, Tahan River (Ridley 2151); Malacca, Mt. Ophir (Ridley); Selangor, Rawang, Ginting Bidai (Ridley 7876); Perak, Larut (Scortechini, King's Coll. 2473), Tea Gardens (Ridley), Bujong Malacca (Ridley 9605); Kedah Peak; Lankawi (Curtis).

var. *Lobbiana*. Pahang, Tahan River (Ridley). Distrib. Mascarene isles, India, Japan, Australia.

L. repens Thw. Singapore, Bukit Timah (Ridley); Malacca (Hervey); Selangor, Ginting Bidai (Ridley 7845), Pahang Track (Ridley 8661); Perak, Bujong Malacca (Ridley 9603), Larut Hills (Fox). Distrib. Mauritius, India, Malay isles, Polynesia.

L. scandens Hook. Johor, Sempang Kiri (Ridley), Gunong Pulai (Hullett); Pahang, Kluang Terbang (Barnes); Malacca, Selandau (Goodenough), Sungei Hudang, Machap (Ridley); Perak, Thaiping Hills (Hervey, Wray), Bujong Malacca (Ridley); Penang, Government Hill (Ridley), Richmond pool (Fox). Distrib. Malay isles.

L. orbiculata Lam. Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 2349); Selangor, Hulu Semangkok (Ridley); Perak, Bujong Malacca (Ridley 9560), Gunong Bubu (Scortechini 133), Thaiping Hills (Ridley); Penang, Government Hill road (Ridley), Richmond Pool (Fox); Kedah Peak (Ridley 5163, 5165).

var. *tenera*. Perak, Gunong Batu Putih (King's Coll. 8039). Distrib. India, China, Australia.

L. Lancea L. Common in woods. "Paku Dudok bukit" "Paku Gurmang." Singapore, Chan Chu Kang (Ridley 1653), Bukit Timah (Ridley 10815); Johor, Gunong Panti (Ridley 4148), Hadji Senawi, Sempang Kiri (Ridley 10967); Malacca, Mt. Ophir (Ridley 3347); Selangor, Batu Tiga (Ridley); Negri Sembilan, Perhentian Tinggi (Ridley), Bukit Danan (Cantley's Coll.); Perak (Scortechini); Tringanu, Bundi (Ros-tado); Penang, Hill (Hullett); Kedah Peak (Ridley 5164). Distrib. Ceylon, Malay isles, S. America.

L. borneensis Hook. In woods. Singapore, Sungei Jurong (Ridley 9842); Johor, Gunong Pulai (Ridley 12132); Pahang, Tahan River (Ridley); Perak, Thaiping Hills (Ridley 3062). Distrib. Borneo.

L. rigida Sm. On clayey soil in woods. Singapore, Sungei Buluh (Ridley); Malacca, Mt. Ophir, Gunong Mering (Ridley 3350, Griffith, Lobb, Cuming 397); Perak, Bujong Malacca (Curtis 3311), Larut at 2300 to 2500 feet alt. (King's Coll. 3086). Endemic.

L. Walkerae Hook. In water in woods. Singapore, Tampinis (Ridley 26791), Changi (6035); Malacca, Mt. Ophir (Ridley 3333). Distrib. Banka.

L. divergens, Wall. In dry woods common. Singapore, Bukit Timah (Ridley 4231a), Bajau (4321), Sungei Morai (1660), Pulau Ubin (Murton); Johor, Gunong Banang (Ridley 10970), Tanjong Kupang; Malacca, Batu Tiga (Derry) and Ayer Panas; Negri Sembilan,

Gunong Angsi (Ridley) ; Perak, Maxwell's Hill (Scortechini 499) ; Penang Hill (Hullett, Roxburgh) ; Tringanu, Bundi (Rostado) ; Kedah Peak (Ridley). Distrib. Borneo.

L. lanuginosa Wall. On trees usually near the sea. Singapore, Jurong (Hullett), Bajau (Ridley 6553) also established in the Botanic Gardens ; Perak (Scortechini) ; Penang (Wallich). Distrib. Africa, Burmah, Australia.

SCHIZOLOMA.

S. lobata Poir. Common in woods. Singapore, Bukit Timah (Ridley 9561) ; Malacca (Cuming 392) ; Johor, Gunong Pulai (Ridley 12131) ; Pahang, Tahan River (Ridley 2168) ; Perak, Larut Hills (Scortechini, Ridley 10670), Gunong Batu Putih (Wray 292) ; Penang, Government Hill (Fox). Distrib. India.

S. davallioides, Bl. Common in woods. Singapore, Bukit Timah common ; Pahang, Tahan River (Ridley 2179) ; Malacca, Mt. Ophir (3348, 3351) ; Negri Sembilan, Gunong Angsi (Ridley) ; Perak, Larut Hills at 4000 feet (Scortechini 230, 437a), Gunong Batu Putih (King's Coll. 8044) ; Penang Hill ; Tringanu, Bundi (Rostado) ; Kedah Peak (Ridley). Distrib. Malay isles.

S. ensifolia Swartz. Singapore, Chua Chu Kang (Ridley 6033, 6028) ; Johor, Gunong Pulai (Ridley) ; Penang Hill. Distrib. Africa, India, Polynesia, Australia.

Sc. heterophylla Dry. *L. Finlaysoniana* Wall. No. 2197. Singapore, Pulau Brani (Hullett) ; Malacca (Robertson) fide Hooker. Not to be found now, perhaps a garden escape. Distrib. Mauritius, India, Malay isles, Hong-kong.

Sc. media Br. Singapore, Pulau Brani (Hullett). Lost like the last. Distrib. Tropical Australia.

Sc. cordata Gaud. "Malay Peninsula" (fide Beddome). Distrib. New Guinea and Rawak.

Sc. Gueriniana Gaud. Malacca (fide Beddome). Distrib. Eastern Malay islands. I have seen no specimens of these last two.

ADIANTUM.

A. caudatum L. Perak, Bukit Kupayiang, Sungai Siput (Ridley), Gunong Tundok (King's Coll. 8351); Selangor, Limestone rocks, Batu Caves (Ridley 8142). Distrib. Tropics of Old World.

A. flabellulatum L. Singapore, Pulau Ubin, on rocks near the sea (Ridley 865), Road side near Changi, a flaccid form on shady banks (Ridley 2680); Malacca, Cape Rachado (Hervey). Distrib. Eastern tropics.

A. Capillus-veneris L. Kedah, Pulau Songsong, an island off the Kedah coast, on rocks by the sea (Ridley 5155). Distrib. Whole World.

A. aethiopicum L. Pahang, Tahan River (Ridley 2173) rocky banks of the river; Penang (Curtis); Malacca (Bishop Hose). Distrib. Africa and South America.

A. lunulatum Burm. Penang, Banks by the road side at Balik Pulau (Ridley 9416) apparently an escape from cultivation; Lankawi (W. Fox). Distrib. Africa, Indo-Malaya, South America.

A. stenochlamys Bak. Singapore, Graves in the old cemetery (Ridley); Malacca, Walls of the old chapel. Distrib. Borneo.

CHEILANTHES.

Ch. tenuifolia Sw. "Paku Telor Belankas," "Paku Resam Padi," "P. Resam Lumut," common on dry banks, etc. Singapore, Pulau Ubin, Sungai Brih (Ridley), also collected here by Norris, Seemann and Wallich; Malacca, Ayer Keroh, Kesang; Negri Sembilan, Seremban; Penang, Penara Bukit, Pulau Tikus; Prov. Wellesley, Tasek Gelugur (Ridley). Distrib. India to Australia and New Zealand.

HYPOLEPIS.

H. punctata Bedd. Perak, Larut (King's Coll. 5015).

PTERIS.

Pt. longifolia, L. Common on walls and dry spots, "Paku Uban Bukit." Singapore, on the aqueduct near the Reservoir, etc.; Johor, Batu Pahat (Ridley); Malacca, on the old chapel, Mt. Ophir (Ridley); Selangor, Batu Caves (Ridley 8145); Perak, Kuala Dipang (Ridley 9549), Bukit Kupayiang, Sungai Siput (Ridley); Penang (Ridley 7079); Tringanu, Bundi (Rostado). Distrib. Whole World.

Pt. cretica L. Rather rare, usually a peculiar grey form. Johor, Gunong Pulai (Ridley, Hullett); Perak, Upper Perak (Wray 3699); Penang Hill (Hullett); Lankawi, Gunong Rayah (Curtis 3381); Selangor, Pahang Track (Ridley). Distrib. Europe, Africa, Asia and America.

P. Grevilleana Wall. Pahang, Pekan (Ridley 2163); Perak, Tambuan near Ipoh (Ridley). Distrib. India.

Pt. ensiformis Burm. Common in dry spots, sometimes in burnt up lalang fields, "Paku Padang." Singapore, Garden Tanglin, Bukit Timah (Ridley), Pulau Ubin (Murton); Johor, Tanjong Bunga (Ridley 6549); Malacca, Bukit Panchur (Cantley), Selandau, Sungai Udang (Derry); Negri Sembilan, Seremban (Ridley 9877); Penang (Bishop Hose); Kedah (King's Coll. 1744); Tringanu, Bundi (Rostado).

var. A very stunted tufted plant growing between stones in streams on Gunong Mering, Ophir (Ridley 3340) and on Kedah Peak at 3000 feet altitude (Ridley 5165). Distrib. Type Indo-China, Australia.

Pt. semipinnata L. "Paku medang," "Paku Pelandok." Malacca, Alor Gajah (Hervey); Pahang, near Pekan (Ridley); Selangor, Ginting Bidai (Ridley 7838); Sungai Ujong (var. *dispar*) (Hullett); Perak, Upper

Perak (Wray 3528); Kinta River (King's Collector 830). Distrib. Malaya, Chino-Japan.

Pt. Dalhousiae Hook. Perhaps only a fine form of *Pt. semi-pinnata*. It was first found by Lady Dalhousie in Penang, but was not seen there again till it was rediscovered by Mr. Curtis on rocks, near Mt. Erskine where the original Government house was, and where doubtless Lady Dalhousie found it. Malacca, Hulu Belangkas (Derry 1082), Bukit Besar, Mt. Ophir (Ridley 9867); Selangor, Langat (Ridley 1681); Penang (Lady Dalhousie), Penara Bukit (Curtis 635, Ridley 7270). Endemic.

Pt. quadrianauta Retz. Singapore, Serangoon Road (Ridley); Johor, Batu Pahat, Patani (Ridley); Malacca, Pulau Undan (Cantley), Bukit Panchur; Selangor, Batu Caves (Ridley 8153), Petaling; Perak, Tambun, Ipoh (Ridley 9543), Goping (King's Coll. 524). Distrib. all the tropics.

Pt. patens Hook. Malacca (Hervey); Selangor, Caves, Kuala Lumpur (Ridley 8640) and 15th mile Pahang Track; Perak, Upper Perak (Wray 3706); Lankawi, Foot of Gunong Raya (Fox). Distrib. Indo-Malaya, Polynesia.

Pt. longipinnula Wall. Perak, Upper Perak (Wray 3741). Distrib. Indo-Malaya.

Pt. aquilina L. Common all over the Peninsula, usually in sandy soil, from the plains to 1000 feet elevation or more. The most remarkable forms are a very pubescent one. Selangor, Bukit Kutu (7837) and a variety with very long pinnules found in Malacca by Mr. Hardy. Distrib. the whole world.

CAMPTERIA.

C. biaurita L. Singapore, Serangoon Road (Ridley); Dindings, Bruas (Ridley 7268); Penang, Penara Bukit (Ridley 6946). Distrib. Tropics old world.

DORYOPTERIS.

D. ludens Wall. Selangor, Limestone rocks at the Caves (Ridley 8135); Perak, Batu Kurau (Scortechini 507). Distrib. Indo-Malaya.

The Selangor form is a very curious one with thick ovate cordate quite obtuse sterile fronds and all the pinnules of the fertile ones narrow and entire.

LITOBROCHIA.

L. incisa Thunb. Singapore, Tanglin, Holland Road; Johor, Tanjong Kupang (Ridley); Perak (Scortechini 471), Larut (King's Coll. 2363, Scortechini 102, 419), Maxwell's Hill abundant.

var. *integrifolia*. Grows with the ordinary form on Maxwell's Hill. Distrib. all tropics.

L. marginata Bory. Malacca (fide Beddome); Selangor, Batu Caves, Kwala Lumpur (Ridley 8146), Bukit Kutu (Ridley 7836). Distrib. Africa, Asia, Australia, Polynesia.

CERATOPTERIS.

C. thalictroides L. In ditches. This plant has a habit of disappearing altogether at certain times of the year and reappearing in abundance. Singapore, Gardens, Ang Mo Kio, Seletar, Changi (Ridley 4227); Pahang, Pekan (Ridley 1509); Malacca (Hervey); Selangor, Bukit Bintang (Goodenough); Penang, Tanjong Bunga (Curtis); Kelantan, Kamposa (Ridley); Lankawi isles (Curtis). Distrib. whole world tropics.

LOMARIA.

L. procera var. *vestita*. Perak, Gunong Batu Putih (3-4000 feet) (King's Coll. 8065).

PLAGIogyria.

P. pycnophylla Kze. Larut 5-5500 feet alt. near top of Gunong Bubu (King's Coll. 7324). Distrib. Indo-Malaya.

P. euphlebia Kze. Perak, Gunong Bubu (Wray 3852). Distrib. India, Japan, Australia.

BLECHNEAE.

BLECHNUM.

B. serrulatum Rich. Singapore, Serangoon Road (Ridley 10917); Malacca (Hervey), Ching (Derry); Pahang, Pekan (Ridley 2160a). Distrib. Malaya, Australia, America.

B. orientale L. Very common in open country "Paku Ular," "Paku Ikan." Singapore, Tanglin, Bukit Timah; Johor, Batu Pahat, Gunong Pulai (Ridley 3750); Malacca, Pulau Besar; Negri Sembilan, Bukit Berumbang (Cantley), Seremban (Ridley 9875); Penang Hill (Ridley). Distrib. Indo-Malaya, China, Australia.

B. Finlaysonianum Wall. Singapore, Chan Chu Kang (Ridley 6121), Reservoir Woods (Ridley 4821); Malacca, Sungai Hudang (Derry); Selangor, 15th mile Pahang Track (Ridley 8656); Pahang, Tahan River (Ridley). Endemic.

SADLERIA.

S. cyatheoides, Kaulf. Perak (Day) fide Beddome.

ASPLENIEAE.

THAMNOPTERIS.

Th. nidus L. Common everywhere on trees. The bird's nest fern. It is supposed to be the home of the demon known as the Langsuir. There are several forms.

var. *musaeifolia* Mett. The form with long broad leaves, 6 feet or more long a foot wide.

var. *phyllitidis* Don. Leaves narrow 2- feet long 2-3 inches wide. A crested form also occurs. Distrib. Indo-Malaya, Mascarenes.

ASPLENIUM.

- A. *Scortechini* Bedd. Perak (Scortechini 128), Maxwell's Hill (Ridley 5186). Endemic.
- A. *Mactieri* Bedd. Penang (Mactier) (fide Beddome) not seen.
- A. *squamulatum* Bl. On rocks and stumps in wet woods common, bulbiferous at the extremity of the fronds. Singapore, Bukit Timah on rocks, Chua Chu Kang, etc.; Johor, Batu Pahat, Hadji Senawi (Ridley 10964), a curious branched form, Tanjong Kupang; Perak, Larut (King's Coll. 6320), Maxwell's Hill (Ridley). Distrib. Malay islands.
- A. *normale* Don. Perak, Larut (King's Coll. 2705). Distrib. India, China.
- A. *subavenium*, Hook. Penang (Beddome). Distrib. Madagascar.
- A. *amboinense* Willd. Perak, Thaiping (Scortechini). Distrib. Malay isles.
- A. *longissimum* Bl. On trees and rocks not rare. Singapore, Mandai (Ridley 10930), Bukit Timah abundant (10810), Tanglin on trees in the Gardens; Prov. Wellesley, Bukit Panchur (Native Collector); Pahang, Pekan (Ridley); Malacca (Hervey), St. John's Hill (Derry); Dindings, Bruas (Ridley); Perak, Larut (King's Coll. 2550). Distrib. Mascarene isles, Indo-Malaya.
- A. *Wightianum* Wall. On rocks. Sungai Ujong (Hullett); Perak (King's Coll. 8130, 10959). Distrib. Indo-Malaya.

A. *sumatrana* Hook. On rocks. Johor, Batu Pahat (Ridley 11067); Selangor, Ginting Bidai (Ridley 7841); Dindings, Pangkor (Ridley); Penang, Penara Bukit (Ridley 7074). Distrib. Malaya.

A. *tenerum* Forst. On trees and rocks. Singapore, Bukit Timah, Ang Mo Kio (Ridley); Johor, Batu Pahat; Pahang, Pulau Tawar (Ridley); Selangor, Pahang Track (Ridley), Gunong Hitam (Goodenough), Bukit Ratu (Ridley 7847); Perak (Scortechini); Penang, Government Hill. Distrib. Ceylon, Malaya, Polynesia.

A. *lunulatum* Sw. Perak, Maxwell's Hill (Ridley), Gunong Batu Putih (King's Coll. 8043). Distrib. India.

A. *boneense* Hook. Perak, Bujong Malacca (Curtis 3312, Ridley 9553), Larut (King's Coll. 1998). Distrib. Malaya.

A. *hirtum* Kaulf. Pahang, Tahan (Ridley); Penang, Government Hill. Distrib. Indo-China, Malaya, Polynesia.

A. *falcatum* Lam. Singapore, Bukit Timah (Hullett). Distrib. Africa, India, Australia.

A. *macrophyllum* Sw. Rocks and trees. Singapore, Pulau Ubin (Kunstler), Sungai Buluh, Chan Chu Kang, Bukit Timah; Selangor, Batu Caves; Negri Sembilan, Perhentian Tinggi; Prov. Wellesley, Bukit Panchur; Perak (Scortechini 1079); Penang, Bukit Erskine (Curtis), Balik Pulau (Ridley). Distrib. of the last.

A. *caudatum* Forst. Perak, Larut (King's Coll. 2351), Caulfield's Hill (Scortechini 390). Distrib. Africa, India, Australia, S. America.

A. *dimidiatum*, Sw. Perak, Goping (King's Coll. 432). Distrib. W. Indies.

A. *cuneatum* Lam. Perak (Scortechini), Bujong Malacca (Ridley 9546). Distrib. all the tropics.

A. *melanophyllum* Scort. Perak, Gunong Bubu (King's Coll. 7403). Endemic.

A. paradoxum Bl. Penang (fide Beddome) ; Perak, Kinta (King's Coll. 7164). Distrib. Malaya.

A. heterocarpum, Wall. Sungei Ujong (Hullett). Distrib. India, China, Malaya.

A. nitidum Sw. On rocks and trees. Singapore, Bukit Timah ; Johor, Gunong Pulai (Hullett), Hadji Senawi, Batu Pahat (Ridley 10965) ; Pahang, Tahan River, Pulau Tioman ; Selangor, Batu Caves (Ridley 8144) ; Perak, Goping (King's Coll. 8180) var. *obtusatum*. Distrib. Africa, Indo-Malaya.

A. unilaterale Lam. *A. resectum* Hook. Paliang, Tahan River (Ridley) ; Malacca, Jeram Nyalas (Derry) ; Selangor, Batu Caves (Ridley 8286, 8649), 15 mile Pahang Track ; Perak, Gunong Batu Putih (Wray 1010), Thaiping Cottage (Hervey). Distrib. Africa, Indo-Malaya, Japan Polynesia.

A. Belangeri Kze. Perak, Thaiping Hills (Scortechini, Hervey) ; Penang, Government Hill (Fox). Distrib. Malaya.

A. bulbiferum Forst. Penang (fide Beddome probably cultivated).

ATHYRIUM.

A. Ridleyi Christ. Malacca, Bukit Besar, Ophir (Ridley 9866). Endemic.

DIPLAZIUM.

D. subserratum Bl. Hills at about 3000 feet elevation. Selangor, Ginting Bidai (Ridley) ; Perak, Maxwell's Hill (Ridley) ; Penang Hill. Distrib. Java.

D. larutense, Bedd. Larut (King's Collection 1913). Endemic.

D. pallidum Bl. Singapore, Toas (Ridley) ; Pahang, Tahan River (Ridley 2167) ; Sungei Ujong (Hullett). Distrib. Burmah to Malaya.

D. porrectum Wall. Common in woods "Paku Naga." Singapore, Chan Chu Kang (Ridley 4399), Holland Road (5700), Reservoir Woods, Garden Jungle; Johor, Batu Pahat (Ridley 10978), Gunong Pulai (3751); Malacca, Batu Tiga (Derry 985), Ayer Panas (Derry 16); Pahang, Tahan River (Ridley); Negri Sembilan, Gunong Angsi (Ridley 9868), Sungai Ujong (Hullett); Selangor, Pahang Track (Ridley 8648); Perak, Larut (King's Coll. 2255), Ulu Kul (10503) and Batang Padang; Kedah, Gunong Jerai (Ridley). Distrib. Malaya.

D. sylvaticum Presl. Singapore (Hullett); Pahang, Tahan River (Ridley 5818); Malacca, Ayer Panas (Hervey); Selangor, Batu Caves, Bukit Kutu (Ridley 7844); Perak, Kinta (King's Coll. 7146), Thaiping (Scortechini), Maxwell's Hill (Fox); Penang Hill (Hullett). Distrib. Africa Indo-Malaya.

D. bantamense Bl. var. *Prescottianum*. Singapore (Hullett); Malacca, Ayer Keroh and Ayer Panas (Ridley); Selangor, Ginting Peras (Ridley 7031); Perak, Maxwell's Hill (Fox), Larut (King's Coll. 2698); Penang Hill. Distrib. Indo-Malaya, China.

D. speciosum Mett. *D. acuminatum* Bl. "Paku Kijang." Singapore, Serangoon Road (Ridley 8937), Garden Jungle, Stag Mount (11271), Reservoir Woods (12202); Johor, Gunong Pulai (Ridley 12130); Malacca, Ayer Panas (Derry); Selangor, Batu Caves; Dindings, Gunong Tungul (Ridley 7271); Kedah, Gunong Jerai (Ridley 5166). Distrib. India.

D. tomentosum Hook. In woods, terrestrial, "Paku Binet." Singapore, Bukit Timah; Pahang, Tahan River; Selangor, Labu River, Petaling, Sungai Ujong, Bukit Sulu (Cantley's Coll.); Perak, Goping (King's Coll. 658), Thaiping Hills (King's Coll. 11428). Distrib. Burma, Malaya.

D. chlorophyllum Bak. Penang (Curtis). Endemic.

D. sorzogonense Presl. Singapore, Selitar (Ridley 6557); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll. 2532), Kinta (King's Coll. 7151), Thaiping (Scortechini).
 var. *major* Bedd. Perak, Gunong Bubu (King's Coll. 7403). Distrib. Malaya.

D. asperum Bl. *D. polypodioides*. var. *asperum*. Malacca (Hervey); Perak (Scortechini), Ulu Bubong (King's Coll. 10849).
 var. *polypodioides*. Pahang, Kuala Tahan (Ridley 2400); Penang abundant (Curtis). Distrib. Indo-Malaya.

D. latifolium Don. Selangor, 15th mile Pahang Track (Ridley 8652); Perak, Larut (King's Coll. 2214, 2346), Gunong Bubu (King's Coll. 8420). Distrib. Indo-Malaya, Australia.

ANISOGONIUM.

A. lineolatum Mett. Perak (Scortechini), Gunong Batu Putih (King's Coll. 8026); Penang Hill (Hullett). Distrib. Malaya.

A. cordifolium Mett. Woods, terrestrial, "Paku Tunjok Langit." Singapore, Bukit Timah (Ridley 5867); Selangor, Kuala Lumpur; Negeri Sembilan, Kupaiyiang (Cantley's Coll.); Perak, Larut (King's Coll. 2711), Cottage, Thaiping Hills (Hervey). Distrib. Malaya.

A. decussatum Sw. Rare. Perak, Thaiping Hills, Gunong Hijau (Ridley), Birch's Hill (Day). Distrib. Malaya.

A. esculentum. "Paku Anjing." Common on stream banks, leaves eaten as spinach. Singapore, Stream along Bukit Timah Road; Selangor, Dusun Tua (Ridley 7863); Pahang, Pulau Manis (Ridley); Negeri Sembilan, Seremban; Perak (Scortechini 437). Distrib. Indo-Malaya, China.

ASPIDIEAE.

DIDYMOCHLAENA.

D. lunulata Desv. Selangor, 15th mile Pahang Track (Ridley 8659) ; Perak, Gunong Chey at 2600 feet (Murton), Gunong Keledang (Ridley 9538), Thaiping Hills (Scortechini, Ridley). Distrib. Burma, Malaya, M ascarene, Polynesia, America.

MESOCHLAENA.

M. polycarpa Bl. Woods "Paku Surai." Singapore, Bukit Timah (Ridley 1658) ; Pahang, Pulau Padang (Ridley 2401), and Tahan River (2396) ; Negri Sembilan, Bukit Sumaiyiang (Cantley's Coll.) ; Perak, Thaiping (Scortechini 464), Goping (King's Coll. 371) and Gunong Bintang (243). Distrib. Malaya.

POLYSTICHUM.

P. semicordatum Sw. Pahang, Tanjong Antan, Pahang River (Ridley) ; Perak, Kuala Dipang (King's Coll. 8282). Distrib. Malaya, Burma, Tropical America.

P. aculeatum var. *biaristatum* Sw. Perak, Larut 2500 to 3000 feet alt. (King's Coll. 6258) ; Penang, Richmond Pool. Distrib. of type whole world.

ASPIDIUM.

A. singaporianum Wall. Woods common, "Paku Todak, Paku Biawak, Paku Murak." Singapore, Bukit Timah, Chua Chu Kang, etc. (Ridley) ; Pahang, Tahan River ; Malacca, Jasin, Sungai Hudang (Derry) ; Sungai Ujong, Bukit Sulu, Gunong Berumbun (Cantley's Coll.) ; Selangor, Kuala Lumpur (Curtis), Bukit Kudah (Ridley) ; Perak, Ipoh ; Tringanu, Bundi (Rostado) ; Penang Hill. Distrib. Malaya.

A. *Kunstleri* Bedd. Perak, Goping (King's Coll. 405). Endemic.

A. *tricuspe* Bedd. Perak, Goping (King's Coll. 975). Endemic.

A. *vestum* Bl. Woods "Paku Jari." Johor, Batu Pahat (Ridley 10669); Pahang, Tembeling River (Ridley 2399); Selangor, Batu Tiga, Batu Caves (Ridley); Perak, Kota Bahru (King's Coll. 382); Penang (Bishop Hose). Distrib. India, Malaya.

A. *angulatum* Sm. Singapore, Bukit Timah (King's Coll. 342), Bukit Panjang (Ridley 12534); Perak (Scortechini), Goping (King's Coll. 580, 586).

A. *semibipiunatum* Wall. In tidal river mud. Johor, Castlewood (Ridley 12225), Gunong Pulai (Hullett); Muar, Sungai Segal (Ridley 12278); Perak (Scortechini); Penang (fide Beddome). Distrib. Malaya.

A. *subtriphyllum*, Hook. Perak, Goping (King's Coll. 4713), Tambun near Ipoh (Ridley 9542).

A. *variolosum* Wall. Singapore, Bajau (Ridley 2419), Bukit Mandai, Bukit Timah (9566, 8939); Johor, Gunong Pulai (Ridley 12129); Selangor, Bukit Kudah (Ridley 1684), Batu Caves (8148), Langat (1685); Perak, Goping (King's Coll. 5908); Penang (King's Coll. 4862), Waterfall (Curtis 1608). Distrib. India.

A. *polymorphum*, Wall. "Paku Kikir." Selangor, Kuala Lumpur (Ridley 2409); Sungai Ujong (Hullett), Bukit Sulu (Cantley's Coll.); Perak, Larut (King's Coll. 2289, 2395). Distrib. Africa, India, Malay isles.

A. *repandum* Willd. Perak, Larut (King's Coll. 6305). Distrib. Malaya.

A. *pachyphyllum* Kze. Perak, Larut (King's Coll. 1816, 2347), Maxwell's Hill (Scort. 218, 493). Distrib. Malaya.

A. decurrents Presl. Perak, Bujong Malacca (Ridley 9535); Tringanu, Bundi (Rostado). Distrib. India, Malaya, China, Polynesia.

A. cicutarium Sw. Woods, "Paku Larat," "Paku Sagala," "Paku Tembaga." Singapore, Bukit Timah, Pulau Ubin (Ridley 4396); Johor, Batu Pahat (Ridley 10976); Malacca, Sungai Hudang; Sungai Ujong, Bukit Payong, Bukit Danan (Cantley). Distrib. all tropical countries.

A. multicaudatum Wall. Perak, Larut (King's Coll. 2297), Upper Perak (Wray 3604).

A. ternatum Bak. Pahang, Pekan (Ridley). Distrib. Borneo.

PLEOCNEMIA.

P. membranifolia Presl. Selangor, Batu Caves (Ridley 8149); Pahang, Tahan River (Ridley); Perak, Goping (King's Coll. 5871). Distrib. India.

P. membranacea Hook. Selangor, Batu Caves (Ridley 8140, 8136, 8643); Perak Scortechini). Distrib. Malaya, China.

P. Lenzeana Hook. Singapore, Cascade Valley, Bukit Timah (Matthew); Malacca (Cantley); Perak, Larut (King's Coll. 2093), Goping (720). Distrib. Indo-Malaya, China, Australia.

P. gigantea Bl. Singapore, Bukit Timah (Ridley); Negri Sembilan, Tampin (Goodenough); Penang, Pulau Butong (Curtis 3401).

P. megalocarpa Hook. Perak, Larut 2-3000 feet alt. (King's Coll. 2236). Distrib. Java.

LASTREA.

L. gracilescens Bl. Rare. Perak (Scortechini). Distrib. India, China, Malaya.

L. immersa Bl. In Woods. Pahang, Kuala Tahan (Ridley); Selangor, Bukit Kutu (Ridley 7848) at the Batu Caves and on the Tras route (8658); Perak, Batu Gajah, Kul (King's Coll. 10502). Distrib. Malay islands.

L. calcarata Bl. Hill woods. Pahang, Tahan River (Ridley).

var. *sericea*. Larut (King's Collector 1571).

var. *ciliata*. Kedah, at Yan (Ridley 5161). Distrib. India.

L. (Dryopteris) Ridleyi Christ. Perak, Bujong Malacca (Ridley 9600); Pahang, Kuala Tahan; Malacca, Base of Mt. Ophir; Selangor, Bukit Hitam (Ridley 7849).
This plant was identified first as *L. viscosa* by Dr. Christ, later he distinguishes it as a species. It much resembles *L. calcarata* in many points. The first number quoted is that of the type. The other plants seem to me to be identical with it.

L. unidentata Bedd. Perak, Gunong Bubu (King's Coll. 7434). Endemic.

L. Thelypteris Desv. Rare. Perak, Tea Gardens (Ridley 3058). Distrib. Europe, Asia, S. Africa, New Zealand.

L. crassifolia Bl. Common "Paku Knau." Singapore, Sungei Morai (Ridley 4397), Bukit Panjang (12532); Johor, Tanjong Kupang (Ridley 6556); Malacca, Sungei Hudang (Goodenough), Ulu Bumban (Hervey), Gunong Mering, Ophir (Ridley 3335); Pahang, Kota Glanggi (Ridley 2159); Selangor, Pahang Track (Ridley 8654); Perak, Larut (King's Coll. 3814), Maxwell's Hill (Scortechini 221); Penang (Ridley).

L. ochthodes Kze. Singapore, Chan Chu Kang (Ridley 9843); Penang, Balik Pulau (Ridley 9579).

L. Dayi Bedd. Singapore (Bishop Hose); Penang (Matthew); Perak, Maxwell's Hill (Day, Kunstler 2126). Endemic.

L. singalanensis Bak. Perak, Thaiping (King's Coll. 3520, 8520).

L. fuscipes Wall. Singapore, Bukit Timah (Ridley 5874); Perak, Ulu Kerling (King's Coll. 8742), Upper Perak (Wray 3712). Distrib. Burma, Malaya.

L. padangensis Beddome. River bank close to water's edge. Perak, Batang Padang, Padang River (King's Coll.). Endemic.

L. syrmatica Willd. Perak, Goping (King's Coll. 8178); Penang, Penara Bukit (Ridley). Distrib. Indo-Malaya.

L. tenericaulis Wall. Penang (King's Coll. 1493); Singapore, established in Tanglin. Distrib. India, China, Australia.

L. intermedia Bl. Perak (Day); Penang (Curtis).
var. *Blumei*. Perak (Scortechini), Larut (King's Coll. 6952).

L. megaphylla Bak. Perak, Larut at 3000 feet alt. (King's Coll. 2822, 6952, 2822).

NEPHRODIUM.

N. unitum L. Damp spots, "Paku Hudang." Singapore, Selitar (Ridley 4394), Galang (4392); Malacca, Ayer Panas; Perak, at sea level (Day, King). Distrib. All tropics.

N. pteroides Retz. *N. terminans* Wall. Singapore, Bukit Timah; Johor, Bukit Soga, Batu Pahat (Ridley 10973); Dindings, Pulau Sembilan (Ridley 3145); Perak, Maxwell's Hill (Ridley 5187); Lankawi (Ridley 8346). Distrib. Indo-Malaya.

N. extensum Bl. Penang Hill (Ridley). Distrib. Indo-Malaya.

N. cucullatum Bl. Singapore, behind the General Hospital (Ridley), Chan Chu Kang, Changi 3596a, 2602; Malacca, Bukit Bruang; Negri Sembilan, Seremban (Ridley 9873). Distrib. Mascarene, Indo-Malaya, Polynesia.

N. aridum Don. Singapore, Jurong, Kranji (Ridley), Green Hill (Hullett); Johor, Castlewood (Ridley); Pahang, Pekan (Ridley); Perak (King 1025). Distrib. India.

N. glandulosum Hook. Perak, Ulu Kerling (King's Coll. 8660). Distrib. Java.

N. lineatum Bl. Perak (Day, Scortechini, King's Coll. 497). Distrib. Malaya.

N. urophyllum Wall. Common in woods, "Paku Gajah," "Paku Merah." Singapore, Bukit Timah (Ridley 5870); Malacca, Bukit Besar, Mt. Ophir (Ridley), Bukit Bruang (Derry 681); Pahang, Temerloh, Kota Glanggi, Tahan River (Ridley 2398); Sungai Ujong, Bukit Danan (Cantley's Coll.), Bukit Putus (Ridley); Selangor, Batu Caves (Ridley 8154), Ginting Bidai (7839); Perak, Slim (King's Coll.), Upper Perak (Wray 3592); Penang Hill (Ridley); Lankawi, Gunong Raya (Curtis). Distrib. Indo-Malaya.
var. *Pinwilliei*. Malacca (Pinwill); Perak (Day).

N. moupinense Bedd. Johor, Gunong Pulai (Ridley 12123).

N. costatum Wall. *Polypodium penangianum* Hook. Penang (Beddome). Distrib. India.

N. pennigerum Bl. Singapore, Rifle Range (Ridley); Johor, Pinerong (Cantley); Selangor, Dusun Tua (Ridley 7861); Perak, Maxwell's Hill (Scortechini 237); Penang Hill (Hullett).
var. *Malayense*. Perak (Scortechini, Day, King's Coll. 2360). Distrib. Indo-Malaya, Africa.

N. molle Desv. Singapore, common Selitar (Ridley 4395), Chan Chu Kang (6120), Bukit Timah (5893), Changi (6037), Pulau Brani (Hullett); Johor, Castlewood (Ridley); Selangor, Bukit Hitam (Ridley 7854); Perak, Ulu Bubong (King's Coll. 10127), Ulu Kerling (8657); Penang (King's Coll. 1570). Distrib. whole world.

N. amboinense Presl. Singapore, Green Hill (Hullett) ; Pahang, Khol, Tembeling River (Ridley) ; Selangor, Dusun Tua ; Perak, Telok Pinang (Ridley 539), Bernam River (King 8800). Distrib. Indo-Malaya.

N. tectum (Wall.) Singapore (Wallich 394 and 354 past), Bukit Timah (Ridley 9567) ; Perak, Ulu Kerling (King 86507), Ulu Bubang (10157? 1205, 8757).

N. crinipes Hook. Perak (Scortechini, King's Coll. 7126). Distrib. India.

N. ferox Moore. Hill forests. Selangor, Ginting Peras (7854) ; Perak, Larut (King's Coll. 4064) ; Penang Hill (Ridley 7080). Distrib. India, Malaya.

N. Ridleyi Christ. Selangor, 15th mile Pahang Track (Ridley 8655) ; Perak, Bujong Malacca (Ridley 9536). Endemic. This very closely resembles *N. ferox*.

N. truncatum Presl. Singapore, Sungai Jurong (Ridley 10774) ; Johor, Batu Pahat ; Selangor, Batu Caves (Ridley 8137) ; Perak, Telok Pinang (Ridley 9540) and Tambun (9544), Goping (King's Coll 556), Maxwell's Hill (Scortechini) ; Penang, Waterfall (Curtis). var. *subintegra* Christ. Penang (Ridley 10136). Distrib. Indo-Malaya, Australia.

N. brachyodon Hook. Perak, Maxwell's Hill (Scortechini 221), Bujong Malacca (Ridley 9537). Distrib. West Indies and Peru.

N. sakayense Zeiller. Perak, Valley of Kiang River near Riam Mountain (Scortechini). Endemic.

N. heterocarpm Bl. Singapore, Green Hill (Hullett) ; Negri Sembilan, Perhentian Tinggi (Ridley 9869) ; Perak, Larut (Scortechini, King's Coll. 6345) ; Penang Hill (Ridley 9225).

N. larutense Bedd. Selangor, Rawang (Ridley 7850), 15th mile Pahang Track (Ridley 8632) ; Perak (Day, King's Coll. 850, 2398).

N. glaucostipes Bedd. Perak, Larut (King's Coll. 2046). Endemic.

N. perakense Bedd. Perak, Thaiping Hills, Birch's Hill (Day). Endemic.

N. Haenkeanum Presl. Singapore, Bukit Mandai (Ridley 1655), Bukit Timah (Matthew).

NEPHROLEPIS.

N. exaltata L. Very common in open country. "Paku Pinang." Singapore, Holland Road, Ang Mo Kio (Ridley); Malacca, Pulau Besar, Lubok Kedondong, St. John's Hill (Ridley); Selangor, Kuala Lumpur (Ridley, a curious crested form); Perak, Bujong Malacca (Ridley 9607), Larut (King's Coll. 5220); Penang Hill (Ridley 7038).

var. *hirsutula*. Singapore, Tanglin; Malacca (Hervey).

var. *pilosula*. Selangor, Kuala Lumpur (Ridley 2408). Distrib. Tropics of old world.

N. volubilis Smith. "Paku Baging," "Paku Racha," "Paku M'rah," "Paku Ningek." Climbing on trees in damp spots. Singapore, Rochor, Sungei Morai (Ridley 4405); Johor, Tanjong Kupang (Ridley); Malacca, Ayer Keroh, Jus (Goodenough); Perak, Batu Kurau (Curtis); Dindings, Pulau Sembilan (Ridley); Tringanu, Bundi (Rostado); Lankawi, Kwah (Curtis). Distrib. India, Malaya.

N. acuta Presl. Johor, Tanjong Kupang; Pahang, Tahan River (Ridley 2373); Selangor, Batu Caves; Perak (Wray 2826, King's Coll. 165, 4955).

var. *lancifolia* Christ. Malacca, Pulau Besar (Ridley 2422). Distrib. Africa, India.

N. davallioides Kze. Selangor, Bukit Hitam (Ridley); Perak, Thaiping (Scortechini), Larut (King's Collectors 6325 and 5007). Distrib. Java.

OLEANDRA.

O. neriformis Cav. Common from 3000 feet and upwards. Malacca, Mt. Ophir; Selangor, Bukit Hitam (Ridley 7832), Ulu Semangko; Perak, Ulu Batang Padang (Wray 1601), Thaiping Hills Cottage (Hervey, Wray, etc.); Kedah, Gunong Jerai (forming dense thickets) (Ridley); Lankawi (Curtis). Distrib. India, America.

O. Cumingii Sm. Kedah Peak (Ridley 5172) with the variety *longipes*. Distrib. Burmah, China, Malaya.

O. musaefolia Kze. Perak (Scortechini). Distrib. India.

POLYPODIEAE.

PHEGOPTERIS.

P. punctatum, Thunb. "Paku Resam Paya." Fronds used for poulticing boils. Selangor, Ginting Bidai (Ridley 7867); Perak, Larut (King's Coll. 5015, Scortechini), Caulfield's Hill (Scortechini 396), Maxwell's Hill (Fox); Malacca, Bukit Kanding (Cantley's Coll.); Penang, Balik Pulau (Ridley 9470). Distrib. Tropics and subtropics.

P. Kingii Bedd. Perak, Larut (King's Collector 2250). Endemic.

P. laserpitiifolia Scort. Perak (Scortechini, King's Coll. 2208). Endemic.

DICTYOPTERIS.

D. Barberi Hook. Common in woods. Singapore, Bukit Timah (Ridley 10778); Malacca (Beddome); Selangor, Rawang (Ridley 7840). Distrib. Malaya.

D. difformis Bl. "Paku Siar." Malacca (Hervey); Pahang, Tanjung Antan, Pahang River (Ridley); Negri Sembilan, Seremban (Cantley's Coll.); Selangor, 15th mile Pahang Track (Ridley 8631); Perak (Scortechini). Distrib. Burma, Malaya.

D. polycarpa Mett. Malacca (fide Beddome) who however he has not seen this species and doubts if there is a specimen in Europe. (*Dictyopteris heterosora* Baker is *Aspidium vastum*).

POLYPODIUM.

§ 1. Fronds entire.

P. parasiticum Mett. Malacca, Mt. Ophir (Hullett); Penang Hill (Fox). Distrib. India.

P. subevenosum Bak. Johor, Gunong Pulai; Gunong Pantai (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 8961); Pahang, River Ban Tahan (Ridley); Perak (Scortechini) Endemic.

P. hirtellum, Bl. Malacca, Mt. Ophir, Gunong Mering (Ridley 3354); Perak (Scortechini), Tea Gardens, Thaiping Hill (Ridley), Gunong Brumber; Pahang (Wray 1553). Distrib. Ceylon, Malaya.

P. sessilifolium Hook. Penang Hill (Ridley 10172, 7134). Distrib. Malaya.

P. universe Bak. Richmond Pool (Matthew); Penang (Curtis). Endemic.

P. Ridleyi Christ. A very small plant with entire fronds thin and undulate when dry; on knots on *Baccaurea parviflora* on Gunong Pulai, Johor (Ridley 12136).

P. adspersum Bl. Singapore (Lobb), probably wrongly localised.

P. setigerum Bl. Singapore (Moore's Herbarium).

§ 2. Fronds lobed.

P. trichomanoides Sw. Malacea, Mt. Ophir, Mering (Ridley 9863) "forma fronde glabra, soris subterminalibus" (Christ); Selangor, Hulu Semangkok (Ridley 12035). Distrib. India, Africa.

P. cucullatum Nees. Malacca, Mt. Ophir (Hullett) ; Pahang. Kluang Terbang (Barnes) ; Selangor, Bukit Kutu (Ridley 7877) ; Perak Bujong Malacca on rocks in a stream (Ridley 9612). Distrib. Ceylon.

P. triangulare Scort. Perak (Scortechini), Gunong Batu Putih (Wray 294). Endemic.

P. cornigerum Bak. Perak, Thaiping Hills, Gunong Hijau (Day, Scortechini). Distrib. Ceylon.

P. streptophyllum Bak. Singapore (Murton) not seen since.

P. Khasyanum Hook. Johor, Gunong Pulai (Hullett) ; Perak at 4000 feet alt. (Day). Distrib. India.

P. obliquatum Bl. Perak, Larut at 3-3500 feet alt. (King's Coll. 2094), Thaiping Hills (Scortechini, Hervey). Distrib. India.

P. nutans Bl. Malacca, Mt. Ophir on trees (Moore's Herbarium). Distrib. Java.

P. subfalcatum Bl. Perak, at 3-4000 feet (Scortechini, Day). Distrib. India.

P. decorum Brack. On trees in mangrove swamps, and on mountain tops. Singapore, Kranji. (Ridley) ; Johor, Gunong Panti, Gunong Pulai, (Ridley 3704) and Tanjong Bunga ; Malacca, Mt. Ophir, and Gunong Mering (Ridley 3342 and 3343) ; Perak, Gunong Keledang (Ridley 9558) ; Penang Hill ; Kedah Peak (Ridley). Distrib. Indo-Malaya, Polynesia.

P. malaccanum Baker. Malacca, Mt. Ophir, Gunong Mering (Ridley 3345), Gunong Ledang (9884). Endemic.

P. fuscatum Bl. Perak (Scortechini), Gunong Babu (Wray) ; Kedah Peak (Ridley).

P. alternidens Cesati. Malacca, Mt. Ophir (Ridley 9862) ; Perak, Thaiping Hills, Tea Gardens (Ridley). Distrib. Borneo.

P. subpinnatifidum Bl. Perak, Gunong Kerbau (De Morgan). Distrib. Java, Polynesia.

P. papillosum Bl. Perak, Larut (King's Coll. 1994), Gunong Haram Parah (Scortechini 665), Kinta on limestone rocks 500 to 1000 feet alt. (King's Coll. 7206). Distrib. Malaya.

P. tenuisectum Bl. Perak (Scortechini). Distrib. Java.

GONIOPHLEBIUM.

G. subauriculatum Bl. Perak (Scortechini); Selangor, Semangkok Pass (Ridley 12033, differs in its pinnules being sessile and somewhat decurrent). Distrib. Indo-Malaya, Australia.

G. verrucosum Wall. Common in open country. Singapore, Pasir Panjang, Bukit Mandai (Ridley 3597a); Johor, Gunong Pulai (Hullett); Selangor, Dusun Tua, Batu Caves (Ridley 8138); Perak, Larut (King's Coll. 5559), Sungai Raya (King's Coll. 965), Thaiping Hills Cottage (Hervey); Lankawi (Curtis). Distrib. Malaya.

G. Korthalsi Mett. Perak, Larut on trees (King's Coll. 2943), Thaiping Hills Cottage (Hervey); Penang Hill (Fox).

NIPHOBOLUS.

N. adnascens Sw. "Sakat Batu" on rocks and trees. Singapore, Pulau Ubin (Ridley 9510), Changi Beach (4347); Johor, Gunong Pulai (Hullett); Malacca, Pulau Undan (Cantley's Coll.), Ayer Keroh; Dindings, Lumut (Ridley 10145); Perak, Harum Parah (Scortechini 844), Kamuning (Machado); Penang Hill (Ridley).

var. *longifolius*. Perak, Thaiping (King's Coll. 8336). Distrib. Africa, India, Malaya, China, Polynesia.

N. acrostichoides Sw. Common on trees in open country. Singapore, Tanglin, Chan Chu Kang (Ridley 6684); Johor, Batu Pahat (Ridley), Jambu Larang (Fielding); Malacca, Mt. Ophir; Pahang, Kuala Pahang; Perak, Gunong Batu Putih (Wray 1232). Distrib. Burmah.

N. Heteractis Mett. Perak, Kuala Dipang (King's Coll. 8275). Distrib. India.

N. stigmosum Sw. Perak, Gunong Pondok (King's Coll. 8361), Batu Kurau (Scortechini). Distrib. India.

N. penangianus Hook. Pahang, Kota Glanggi (Ridley); Selangor, Kuala Lumpur (Curtis); Perak, Kinta (King's Coll. 7083); Penang, just above the waterfall (Hullett). Distrib. Burmah.

N. hoyae folium T. Moore. Singapore, Woodlands (Matthew); Johor, Mt. Austin (Ridley).

N. nummulariae folius Sw. On trees, "Berunas Jantan." Pahang, Kuala Pahang (Ridley); Sungai Ujong, Bukit Sulu (Cantley); Perak, Tambuan near Ipoh (Ridley 9829), Kuala Dipang (King's Coll. 8270). Distrib. India.

DIPTERIS.

D. Horsfieldii Br. On rocks by the sea, and also on mountain tops. Singapore, Harbour, Kranji (Ridley 1673), Pulau Tekong (4227); Johor, Gunong Pulai, Gunong Panti, and by the Scudai River (Ridley); Malacca, Mt. Ophir; Selangor, Pahang route (Machado), Hulu Semangkok (Ridley); Perak (Scortechini); Penang Hill (Hullett, etc.); Kedah Peak (Ridley). Distrib. Malay isles, Polynesia.

D. Lobbianae Hook. On banks of streams. Johor, Gunong Panti (Ridley 4141); Pahang, Tahan River (Ridley 2170); Malacca, Mt. Ophir (Derry); Perak (Scortechini, Wray 2920), Bujong Malacca (Ridley); Kedak Peak (Ridley). Distrib. Borneo.

DRYNARIA.

D. splendens Hook. Singapore (fide Beddome).

D. quercifolia L. Common on trees, "Sakat Laipang." The leaves are burnt and applied to the stomach for mis-

carriage. Singapore, Pulau Ubin (Ridley 9484), Bukit Timah, Tras (1673); Johor, Scudai River (Ridley 12223); Pahang, Tembeling River; Malacea, Bukit Bruang (Cantley); Perak (Scortechini), Batang Padang (King's Coll.); Penang Hill (Ridley). Distrib. Indo-Malaya.

D. Linnaei Bory. Singapore, Changi, Serangoon (Ridley 4352), Tanjong Gol; Pahang, Pulau Datoh, Pulau Chengei (Ridley); Perak, Batang Padang (King's Coll. 8087); Penang, near the Bath (Ridley 7077); Tringanu, Bundi (Rostado). Distrib. India.

D. Heracleum Kze. "Paku Sulo." Johor, Tanjong Kupang (Ridley 4353); Perak, Maxwell's Hill (Scortechini 228), Larut (King's Coll. 6302), Box Hill (Fox).

D. rigidula Sw. On rocks and trees. Selangor, 15th mile Pahang track (Ridley); Perak (Scortechini), Bujong Malacea (Ridley 9552); Penang, Penara Bukit (Ridley 6945); Kedah Peak on Precipices (Ridley 5151). Distrib. Malaya, Australasia.

PLEOPELTIS.

Pl. accedens Bl. Sungai Ujong (Hullett); Selangor, 15th mile Pahang Track (Ridley); Perak, Bujong Malacea (Ridley 9616), Larut (King's Coll. 1900), Kuala Kangsa (Ridley). Distrib. Malaya, Polynesia.

P. Wrayi Bak. Pahang, Kluang Terbang (Barnes); Perak, Gunong Hijau, Cottage and the Tea Gardens, Thaiping Hills (Day, Scortechini, Wray, King 2358, 3673, Ridley, Hervey). Endemic.

P. stenophylla Bl. High up on lofty trees in the low country, on rocks and low trees in the hills. Singapore, Bukit Timah (Ridley 4350); Johor, Gunong Banag, Bukit Pahat (Ridley 1255); Perak, Maxwell's Hill (Scortechini 263); Penang (Cantley); Kedah Peak (Ridley). Distrib. Malaya.

Pl. sinuosa Wall. On trees common in the south, remarkable for the thick hollow rhizomes full of biting ants. Singapore, Gardens, Bukit Timah, Jurong (Ridley 5864); Johor, Gunong Pulai (Hullett); Penang (Curtis 10137). Distrib. Malaya.

Pl. rupestris Bl. Perak at 4000 feet alt. (Scortechini 251, King 7355), Gunong Inas at 5000 feet (Wray 4123).

Pl. longifolia Mett. Singapore, Sungei Morai, Bukit Timah (Ridley); Johor, Tebing Tinggi (Ridley), Gunong Pulai (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 10820); Perak, Larut (King's Coll. 1904, 2741), Waterloo (Curtis), Bujong Malacca (Ridley 9614). Distrib. Indo-Malaya.

Pl. superficialis Bl. Perak, Larut 3 to 4000 feet (King's Coll. 2180, Scortechini), Maxwell's Hill (Ridley). Distrib. India, China.

Pl. angustata Sw. "Paku Hilan," common on trees. Singapore, Gardens (Ridley 10162), Pulau Ubin (King's Coll. 201); Sungei Morai, Bajau, Changi (a forked form); Johor, Tanjong Bunga, 4th mile from Johor (Ridley); Perak, Thaiping Hills (Ridley, Scortechini 1082), Kuala Kangsa (Ridley); Penang, Government Hill, Convalescent Bungalow (Ridley). Distrib. India, Australia.

Pl. platyphylla Sw. On rocks and trees at high elevations, a beautiful species. Selangor, Pahang Track (Ridley 8653) and Semangkok Pass; Perak, Gunong Haram Parah (Scortechini); Kedah, Yan (Ridley 5169).

Pl. membranacea Don. Perak (Scortechini).

Pl. punctata L. *Pl. irioides*. Common on low trees and stumps. Singapore, Chan Chu Kang, Serangoon (Ridley 8935), Sungei Buloh, Gardens, etc.; Malacca, Pulau Besar; Selangor, 15th mile Pahang Track (Ridley 8657); Perak, Thaiping (Scortechini 538); Penang (King's Coll. 5069), Pulau Badak (Curtis 3958). Distrib. Tropics of Old World.

P. musaeifolium Bl. Selangor, Ginting Bidai, Batu Caves (Ridley); Perak, Sungei Rayah (King's Coll. 862) and Larut 1890). Distrib. Malaya.

P. Scortechinii Bedd. Perak, Maxwell's Hill (Scortechini 2161), Thaiping (King's Coll. 8382). Endemic.

Pl. pteropus Bl. Perak (Scortechini), Kinta River (King's Coll. 386). Distrib. Indo-Malaya, China.

Pl. incurvata Bl. On rocks and trees at high elevations. Selangor, Bukit Hitam; Perak, Bujong Malacca (Ridley), Cottage Thaiping Hills (Hervey); Kedah Peak (Ridley) one form with simple ovate sterile fronds, and simple linear fertile ones. Distrib. Malaya.

Pl. insignis Bl. Malacca (fide Beddome).

Pl. Phymatodes L. "Pulau Wangi," "Sakat Hitam." A very common and variable fern. The sweetly scented fronds have an odour of Coumarin when dry and are used for putting among clothes to scent them by natives. Singapore, Gardens, Passir Panjang, Tampinis River, Changi (Ridley 2681), Pulau Ubin (4360), Bukit Timah 4359); Johor; Pahang, Kuala Pahang (Ridley 1448), Pekan (1581); Malacca, Pengkalan Minyak; and Bukit Panchur (Cantley); Perak, Thaiping (Scortechini 539); Dindings, Lumut (Ridley); Penang, Top of the Hill (Ridley 7005); Lankawi (Curtis). Distrib. All the Tropics of the Old World.

Pl. longissima Bl. Perak, Kinta River (King's Coll. 402). Distrib. Indo-Malaya.

Pl. nigrescens Bl. "Paku Chiai." Singapore, Bukit Timah (Ridley, King's Collector 349); Sungei Ujong, Bukit Sulu (Cantley's Coll.); Selangor, Batu Caves (Ridley); Perak (Scortechini); Tringanu, Bundi (Rostado). Distrib. India.

Pl. laciniiata Bl. Perak, Thaiping Hills, Coulfield's Hill (King's Coll. Day).

Pl. palmata Bl. Perak, Gunong Batu Putih (Wray 580), Maxwell's Hill (Scortechini); Penang Hill (Ridley 7154); Prov. Wellesley, Bukit Panchur (Ridley 12639). Distrib. Malay islands.

GRAMMITIDAE.

MONOGRAMME.

M. paradoxa Fee. Penang Hill, rocks at Richmond Pool (Ridley 7135). Distrib. Ceylon, Malaya, Australia.

M. trichoides Sm. Rocks in forest. Singapore, Bukit Timah (Ridley); Selangor, Pahang track, 15th mile (Ridley). Distrib. Philippines.

M. dareaearpa Hook. A minute hair-like plant. Singapore Bukit Timah, on rocks at the base of the hill (Matthew). Distrib. Borneo.

STEGNOGRAMME.

S. aspidioides Hook. Perak, Kinta (King's Coll. 7207). Distrib. Indo-Malaya.

GYMNOGRAMME.

G. calomelanos Kaulf. "Paku Merak." Probably introduced but now scattered widely over the whole Peninsula and often far from cultivation. Singapore, Chan Chu Kang, Pulau Ubin, etc. (Ridley); Johor, Tanjong Ku-pang; Malacca (Hervey); Selangor, Rawang (Ridley 7834), Kuala Lumpur (Goodenough); Penang, Waterfall Hill (Ridley 3064); Tringanu, Bundi (Rostado).

SYNGRAMME.

S. fraxinea Don. Perak, Larut at 2-2300 feet elevation (King's Coll. 2251, Scortechini), Distrib. Africa, Indo-Malaya, Polynesia, Japan.

S. Lobbiana Hook. Johor, Gunong Panti (King 205).

S. Wallichii Hook. Damp places in forests. Singapore, Bukit Timah (Ridley 5869) a variety with branched fronds is not rare, Chua Chu Kang (Ridley 10694); Johor, Tanjong Kupang; Perak, Maxwell's Hill (Ridley); Penang Hill. Distrib. Borneo.

S. alismaefolia Hook. "Paku Tombak." Less common than the last but really hardly distinct. Singapore, Chan Chu Kang; Malacca, Merlimau (Cantley's Coll.), Ayer Keroh (Ridley); Negri Sembilan, Bukit Kayu Arang (Cantley); Perak, Thaiping (Seortechini). Distrib. Mal.

S. Dayii Bedd. Perak Pass between Kuala Kangsa and Kinta at 2000 feet elevation (Day). Endemic.

SELLIGUEA.

S. Feei Hook. On trees low down. Common in mangrove swamps. "Paku Galah Hantu Laut." Singapore, Kranji, etc.; Johor, Gunong Pulai; Malacca, Batu Tiga (Derry); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll 3942), Box Hill (Fox), Bujong Malacca (Ridley); Penang Hill (a branched form). Distrib. Malaya.

S. membranacea Hook. Singapore (Moore's herbarium); Perak, Ulu Kerling (King's Coll. 8844, 948, 2986), Upper Perak (Wray 3638). Distrib. Malaya.

S. Maingayi Baker. Malacca (Beddome). Endemic.

S. campyloneuroides Bak. Perak, Selama River (King's Coll. 3112), Goping on shrubs (8145). Distrib. Borneo.

LOXOGRAMME.

L. lanceolata Sw. Malacca, Bukit Tampin (Goodenough); Selangor, 15th mile Pahang Track (Ridley 8646); Perak, Kinta (King's Coll. 4754), Larut (2235), Bujong Malacca (Ridley 9615). Distrib. Africa, Indo-Malaya, China, Polynesia.

L. involuta Don. Selangor, 15th mile Pahang Track, Rawang Camphor woods (Ridley 7831); Sungei Ujong (Hullett); Perak, Kuala Dipang (King's Coll. 8280), Kinta (Kunstler 373), Cottage Thaiping Hills (Hervy). Distrib. Indo-Malaya, Polynesia.

L. avenia Bak. Pahang, Tahan River (Ridley's Collector); Selangor, 15th mile Pahang Track (Ridley); Penang Hill (Ridley). Distrib. Malaya.

BRAINEA.

Br. insignis Hook. On the ground near the sea. Dindings, Pulau Sembilan (Curtis and Ridley 3056). Distrib. India, Hongkong.

MENISCUM.

M. triphyllum Sw. Singapore, Ditches near Macpherson Road (Ridley 9146); Pahang, Tahan River (Ridley); Perak, Upper Perak (Wray 3522). Distrib. Indo-Malaya, China.

M. cuspidatum Bl. Singapore, Bukit Timah, Chan Chu Kang, Upper Mandai (Ridley 4399); Johor (Hullett), Batu Pahat on Bukit Soga (Ridley 10972); Malacca, Sungei Hudang Road (Derry 86); Sungei Ujong, Tam-pin (Goodenough) Penang, Government Hill (Ridley). Distrib. Indo-Malaya.

M. salicifolium Wall. On rocks. Singapore, Selitar (Bishop Hose); Perak, Relau Tujor (Wray 183), Bujong Malacca (Ridley); Penang, Government Hill (Ridley). Endemic.

M. sp. Perak, Larut Hills (Curtis 3717).

ANTROPHYUM.

I doubt if any of these species are specifically distinct except perhaps the last.

A. reticulatum Kaulf. On rocks. Singapore, Bukit Timah, Selitar (Ridley 4345); Johor, Batu Pahat (Ridley

11069); Pahang, Tahan, Kota Glanggi (Ridley); Malacca, Alor Gajah; Selangor, Gunong Hijau (Goodenough), Labu River, Batu Caves (Ridley); Perak (Scortechini), Bujong Malacca (Ridley); Penang Hill. var. *parvulum* Bl. Perak (Hullett). Distrib. India, Australasia.

- A. *plantagineum* Kaulf. Penang Hill (Ridley). Distrib. Indo-Malaya, Polynesia.
- A. *semicostatum* Bl. Dindings, Lumut (Ridley); Perak, Maxwell's Hill (Scortechini 237). Distrib. Malaya, Polynesia.
- A. *latifolium* Bl. Sungai Ujong (Hullett); Perak (Scortechini). Distrib. Indo-Malaya.

VITTARIA.

V. elongata Sw. Common on trees. Singapore (King's Coll. 223), Thomson Road (Murton), Green Hill (Hullett), Passir Panjang, Sungai Morai, etc. (Ridley); Johor, Pengaram (Ridley); Muar, Sungai Pauh; Malacca, Selandan, Mt. Ophir (Ridley); Pahang, Pekan (Ridley); Selangor, Ginting Bidai; Perak, Bujong Malacca (Ridley). Distrib. Tropics of Old World.

V. lineata Sw. Common on trees. Selangor, Ulu Selangor (Goodenough); Kedah (King's Coll. 1739). Distrib. All Tropics.

V. sulcata Kuhn. On trees at high altitudes. Selangor, Bukit Hitam (Ridley); Malacca, Gunong Mering, Ophir (Ridley 3352); Perak (Scortechini); Kedah Peak (Ridley). Distrib. Ceylon.

V. falcata Kze. Malacca, Gunong Tunduk, Ophir (Ridley 9864); Pahang, Keluang Terbang (Barnes); Selangor, Hulu Semangkok; Perak, Bujong Malacca (Ridley).

V. scolopendrina Presl. Singapore, Kranji, Tanglin, Chua Chu Kang (Ridley 1030); Pahang, Tahan River (Ridley); Perak, Maxwell's Hill (Scortechini), Goping (Bishop Hose), Gunong Batu Putih (Wray 1132);

Kedah (Curtis); Lankawi, Gunong Raya at 2500 feet (Curtis). Crested and branched forms occur in Tanglin and elsewhere in Singapore. Distrib. Africa, Indo-Malaya.

TAENITIS.

T. blechnoides Sw. Common in woods all over the Peninsula, and very variable. "Paku Pijai," "Paku Balu."

var. a. Fronds simple. Malacca, Mt. Ophir (Ridley 3366) and Mering. A branched form occurs on Ophir; Selangor, Pahang Track (Ridley).

var. b. Fronds pinnate narrow. The commonest form. Singapore, Garden jungle, Sungei Morai, Selitar (Ridley 4334); Johor, Gunong Pulai (Ridley); Malacca, St. John's Hill, Pulau Besar (Ridley 4335); Pahang, Tahan River, Kuala Semantan (Ridley); Perak (Scortechini 34); Kedah Peak.

var. c. Fronds pinnate very broad. Singapore, Bukit Timah, Tras (Ridley 8568) and Changi (2683). Distrib. India, Malaya.

DRYMOGLOSSUM.

D. piloselloides Presl. Extremely common on trees, and very troublesome, covering the branches "Sakat Ribu-Ribu." A curious crested form on the trees of the Cathedral close (Bishop Hose). Singapore, everywhere Bukit Mandai (Ridley 6032), Teban (4346), Pulau Ubin, Tanglin, etc.; Johor, common; Malacca, Ayer Panas; Perak, Thaiping (Scortechini), Kamuning (Machado); Tringanu, Bundi (Rostado). Distrib. Indo-Malaya.

HEMIONITES.

H. arifolia Burn. In limestone districts usually on the rocks. Perak, Kamuning on the ground (Ridley), Larut (King's Coll. 4174); Lankawi (Curtis). Distrib. Indo-Malaya.

H. sp. Selangor, Gua Batu (Ridley 8135).

ACROSTICHEAE.

ELAPHOGLOSSUM.

Most of the local species much resemble each other, and are rather difficult to separate. The species are not so rare as might appear but seldom fruit.

E. laurifolium Bedd. *E. latifolium* Bedd. Singapore, Kranji (mangrove swamps); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Perak, Top of Gunong Batu Putih (Wray 319); Kedah, Gunong Jerai (Ridley 5168).

E. coniforme Sw. Pahang, Tahan River (Ridley); Penang Hill (W. Fox).

E. Norrissii Hook. Malacca, Mt. Ophir (Ridley 3334, 9870); Penang (Ridley); Perak (King's Coll. 2222). Endemic.

STENOCHLAENA.

S. palustre L. One of the commonest ferns, "Paku Ramu," "P. Mesin, or P. Miding or Lamiding." The young leaves very popular as a vegetable. Singapore, Tanglin, Balestier Road (Ridley 6249); Johor, Tanjung Kupang (Ridley 4234) and Kota Tinggi; Malacca (Hervey), Pulau Undan (Cantley's Coll.); Perak, Goping (King's Coll. 834), Waterfall Thaiping (Wray, Scortechini 469); Tringanu, Bundi (Rostado). Distrib. India, China, Polynesia.

S. sorbifolia L. Common in forests. The variation in the form of the fronds is very remarkable. Singapore, Bukit Timah; Johor, Gunong Pulai (Hullett); Pahang, Tahan River (Ridley); Selangor, Semangkok Pass, Ulu Langat, Batu Caves (Ridley); Perak (Scortechini), Larut (King's Colo. 4205), Upper Perak (Wray 3703), Waterfall Hill, Maxwell's Hill, etc. Distrib. All tropics.

S. perakense Bedd. Perak, Thaiping (King's Coll. 8345). Endemic.

POLYBOTRYA.

P. appendiculata Willd. On rocks in forest. Singapore, Bukit Timah (King's Coll. 335) and all other collectors, abundant. Dindings, Lumut (Ridley); Perak (Scortechini); Lankawi (Curtis).

var. *subintegra* Bedd. Johor, Batu Pahat (Ridley). Distrib. Indo-Malaya, China.

STENOSEMIA.

S. aurita (Sw.) Limestone Rocks. Pahang, Kota Glanggi (Ridley); Selangor, Batu Caves (Ridley); Perak, Kwala Dipang (Ridley 9547), Goping (King's Collector 442). Distrib. Malay islands to the Solomon isles.

S. sp. Penang Hill (Ridley 7078).

GYMNOPTERIS.

G. variabilis Hook. Perak, Kinta (Scortechini 7107).

var. *axillaris*. Perak, Ulu Bubong (King's Coll. 10028). Distrib. India.

G. spicata Linn. fil. Not very common. Pulau Tioman (Ridley); Perak, Maxwell's Hill, Cottage Thaiping Hills (Ridley, King's Collection 6373); Penang Hill rocks on the top (Ridley, King's Coll. 1597); Kedah. Distrib. India.

G. flagellifera Wall. In muddy spots by streams. Singapore, Stagmount (Ridley), Pulau Tioman; Selangor, Rawang; Perak (Scortechini), Goping (King's Collection 1097). Distrib. India.

G. subrepanda Hook. Singapore, Bukit Timah (Ridley); Perak, Chanderiang (King's Collection 5797), Upper Perak (Wray 3379), Thaiping Hills Cottage (Ridley). Endemic.

G. Prestiana Hook. In dense forests. Singapore, Bukit Timah (Hullett, Ridley, etc.). Distrib. Concan and Philippines.

G. contaminans Wall. Perak (Scortechini).

G. costatum Wall. Penang, Balik Pulau (Curtis). Distrib. India and Burmah.

LOMAGRAMMA.

L. perakensis Bedd. Perak at 400 feet elevation (Day, King's Collector 8345). Endemic.

ACROSTICHUM.

A. aureum L. Common in tidal rivers, but sometimes long persisting after the river has disappeared. I have seen it thus in open places far inland as at the base of Gunong Pantai (Johor), Bukit Asahan (Malacca) and in the Botanic Gardens in Singapore. It is abundant in Singapore even in the town canals; Johor, Batu Pahat, etc.; Dindings at Lumut; Selangor, Klang, etc.; Perak; Kedah; Penang. Distrib. All tropics.

PHOTINOPTERIS.

Ph. rigida Wall. On boughs of trees overhanging rivers and mangrove swamps. Singapore, Kranji, Woodlands (Matthew); Johor; Perak, Goping (King's Coll. 861); Penang (Curtis). Distrib. Malaya.

P. drynarioides Hook. Rare. Penang Hill (Bishop Hose). Distrib. Malay isles.

CHYSODIUM.

Ch. bicuspis Hook. In mossy spots by streams at 3000 feet elevation. Malacca, Mount Ophir on the banks of the stream above Padang Batu (Ridley 9872); Perak, Thaiping Hills (Ridley). Distrib. Java and Formosa.

PLATYCERIUM.

Pl. grande Sm. Singapore (fide Beddome, but no one else seems to have seen it here); Lankawi islands, Curtis

found one or two plants there. Distrib. Malaya, Australia.

Pl. biforme Bl. The common elk's horn fern, abundant every where and attaining a very large size. Singapore, Tanglin, Selitar (Ridley 3595), Bukit Timah (Ridley 4354, 8049). All over the peninsula. Distrib. Indo-Malaya.

var. *erecta*. A much smaller plant with the fertile fronds erect and short. Sterile ascending fronds a foot long and as wide, very strongly ribbed, rounded in outline, and dotted over with hairs arranged stellately, fertile fronds stiffly erect 8 to 18 inches long, 8 inches across, dichotomously branched, the tips of the branches rounded, fertile lobe spathulate or obovate pedicelled 2-5 inches long and as wide in the widest part. Singapore, Bukit Timah on very lofty branches of trees (Ridley 10830). Bishop Hose first pointed out this plant to me some years ago on perfectly inaccessible boughs of a lofty *Shorea* tree 100 feet or more from the ground. There are a number of plants on the boughs, all are quite similar and there are no typical specimens of *Platycerium biforme* on the tree though it is abundant in the surrounding forests. I have only been able to obtain fallen fronds. Mr. C. J. Matthew took specimens to Kew and Mr. Wright notes on them as follows. "I do not think this can be separated as a distinct species from *Platycerium biforme* Bl. but is a form produced by growing in exposed situations and is worthy of a varietal name. It has also been collected in Borneo by Motley who remarks "on the highest branches of trees in very exposed places perhaps only [a form] of the long drooping plant growing in damp and shade." The plant is certainly most closely allied to *P. biforme* Bl., but I hardly think it can be classed as merely a form or state of that plant. I have seen the ordinary form growing in quite exposed places, on lofty trees and showing no variation. The variety with its short stiff erect fronds, has a most curious appearance, and really looks more distinct from the typical form than any other *Platycerium* I have seen. I note however that

in *P. biforme* the young branched fronds when first protruded point directly upwards and then first spread out horizontally, then deflex. On the same trees which bear this curious fern, grows also *Lecanopteris carnosa* the only lowland locality I know for this plant.

SCHIZEACEAE.

SCHIZAEAE.

S. malaccana Bak. Mossy places at 4000 feet elevation. Malacca, Mt. Ophir (Ridley 9860); Kedah Peak (Ridley). Distrib. Malay isles.

S. dichotoma Sw. Common in dry woods or sandy spots, whole peninsula, "Paku Tumbar," "Paku Jarum." Singapore, Toas, Passir Panjang, Kranji, etc. (Ridley); Johor, Pengaram, Gunong Pulai (Ridley); Pahang, Kwantan (Craddock), Rumpin River, Pekan (Ridley); Malacca, Brisu and Sungai Hudang (R. Derry); Perak, Ulu Kul (King's Coll. 10759). Distrib. nearly all the tropics.

S. digitata Sw. Common in woods. Singapore, Garden Jungle, Reservoir Woods, etc. (Ridley); Johor, Tana Runto (Ridley); Pahang, Kuala Tembeling; Malacca, Pengkalan Ampat, Selandau (Ridley); Negri Sembilan, Kuala Pedas; Selangor, Batu Caves on the top of the rocks; Perak (Scortechini), Thaiping Hills, Tea Gardens (Ridley), Waterfall Hill (Wray); Penang Hill; Kedah Peak. Distrib. Indo-Malaya, Polynesia.

LYGODIUM.

L. circinatum Sw. *L. dichotomum* Bedd. One of the commonest and best known ferns, "Ribu-Ribu Dudok," or "Bukit," "Paku Jari Merah" (Tringanu). Leaves used for headache. Singapore, Tanglin, Bajau, Chan Chu Kang (Ridley 4229, 8057), etc.; Malacca, Sungai Udang, Chabau (Ridley 9871); Pahang, Tahan River;

Perak, Waterfall Hill (Wray 2324), Larut (King's Coll. 7503); Tringanu, Bundi (Rostado); Lankawi (Curtis). Distrib. Indo-Malaya, China.

L. microphyllum Br. Not rare in open grassy places. Singapore, Kranji, Botanic Gardens (Ridley 6917); Johor, Kampong Bahru, Tebing Tinggi (Ridley); Perak (Scortechini). Distrib. Indo-Malaya.

L. flexuosum Sw. Common in the low country, "Akar Sidin," "Ribu-Ribu Gajah." Singapore, Botanic Gardens; Pahang, Kuala Tembeling (Ridley); Malacca, Pengkalan Minyak, Gunong Berumbun (Cantley's Coll.); Penang Hill, Telok Bahang (Curtis 625); Tringanu, Bundi (Rostado); Kedah Peak (Ridley); Kelantan, Kuala Lebir (Dr. Gimlette).
var. *alta* Clarke. Perak (King's Coll. 2975). Distrib. Indo-Malaya, Africa, Australia.

L. polystachyum Wall. Pahang, Kuala Tembeling (Ridley 2156); Perak, Upper Perak (Wray); Penang, Waterfall (Hullett). Distrib. Burmah.

MARATTIACEAE.

ANGIOPTERIS.

A. evela Hoffm. Not rare in woods, commonly known locally as the elephant fern. Singapore, Bukit Timah (Hullett, etc.); Pahang, Pekan (Ridley); Perak, Maxwell's Hill (Scortechini 219, King's Coll. 5203). Distrib. Indo-Malaya, Australia, Madagascar.

KAULFUSSIA.

K. aesculifolia Bl. Terrestrial in damp spots or on rocks. Selangor, Batu Caves covering the ground in great masses, in damp spots (Ridley 8640); Perak, Thaiping Hills (Curtis 3718, Ridley, Scortechini) on rocks or the ground, Kinta (King's Coll. 4784). Distrib. Indo-Malaya.

OPHIOGLOSSACEAE.

OPHIOGLOSSUM.

O. reticulatum L. Penang in dry spots in the waterfall valley (Ridley 9837, 11394). Distrib. Eastern Tropics.

O. nudicaule L. fil. In grassy spots. Singapore, Bukit Panjang (Ridley 4205), Chan Chu Kang (Ridley 2421). Distrib. Tropics.

O. pendulum L. Singapore, Tanglin, Bukit Mandai, etc. (Ridley); Selangor, Rawang, Camphor Woods (Ridley); Perak, Gunong Batu Putih (Wray 1133). This plant usually grows on *Platycerium* but also on trees. It has a habit of suddenly appearing and spreading widely and then apparently disappearing. At one time the only locality I knew for it was on a tree in the Barracks Grounds. This died and the plant disappeared there, but then appeared in the Botanic Gardens, and spread rapidly. Distrib. Eastern Tropics.

HELMINTHOSTACHYS.

H. zeylanica L. In damp muddy spots in open country in thickets. Malacca, Brisu (Derry); Pahang, common along the Pahang River, Pekan, Pulau Manis, Pulau Jellam, Kuala Tembeling; Selangor, near the Batu Caves (Ridley 8152); Perak (Scortechini), Blanja (Wray 140); Tringanu, Ismail Rantau (Down). Distrib. Eastern Tropics.

ADDENDUM.

Alsophila glabra Hook. Bukit Timah and other forests in Singapore in damp spots. This is the plant mentioned as *Amplicosmia alterans* from Singapore. It is named by Mr. Matthew.